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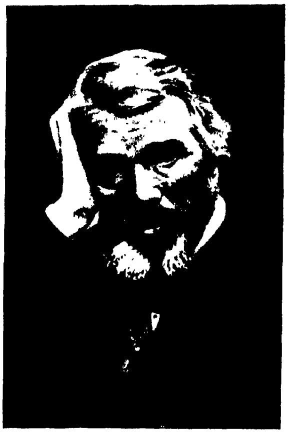
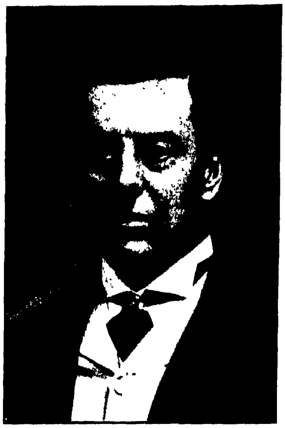
PORTRAITS OF MEN OF THE TIME.—III.


Thomas Carlyle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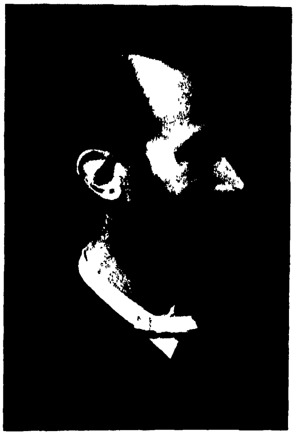
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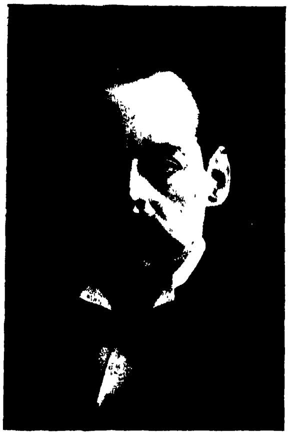
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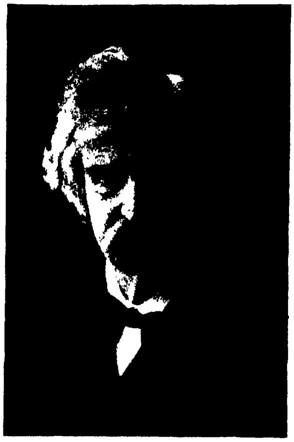
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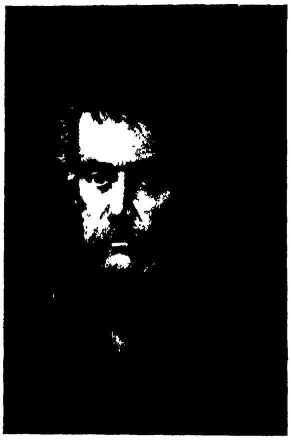
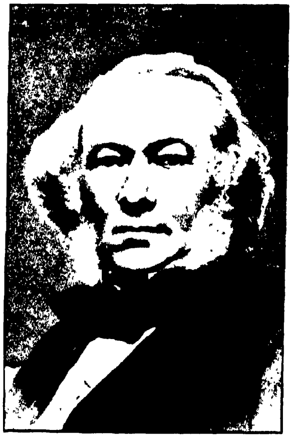
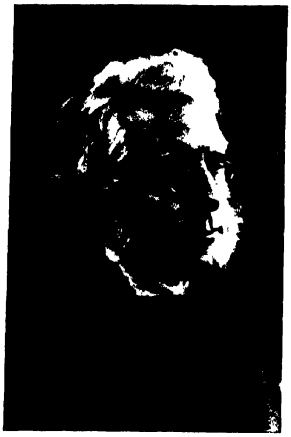
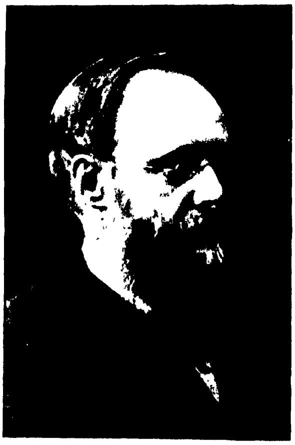

Lord Clyde


Richard Cobden


Bishop Colenso


Wilkie Collins

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Editor of Ogilvie's "Imperial Dictionary"
Assisted by
MANY SPECIALISTS
IN
THE VARIOUS BRANCHES OF HUMAN KNOWLEDGE

Volume III

THE GRESHAM PUBLISHING COMPANY
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1902

LIST OF PLATES AND MAPS.

VOLUME III.

	Page
PORTRAITS OF MEN OF THE TIME.—III. - - - - - -	*Frontispiece.*
DOMINION OF CANADA.—Map of - - - - - - - - - - -	64
CARNIVOROUS ANIMALS.—I. Lion, Tiger, Leopard, Hyæna, &c. - - - - -	123
Do. do. II. Wolf, Fox, Jackal, Polecat, Otter, &c. - - -	124
Do. do. III. Ermine, Glutton, Badger, Bear, Seal, &c. - - -	124
CAVALRY.—Types of British Cavalry, in Colour - - - - - - - - - -	187
CERAMICS.—Artistic Pottery of Various Kinds, in Colour - - - - - - -	213
CETACEA EDENTATA, &c.—Whale, Manatee, Ant-eater, &c. - - - - - -	218
CHAMELEON, THE, in Colour - - - - - - - - - - - - - -	233
CHEIROPTERA, INSECTIVORA, &c.—Bat, Hedgehog, Mole, Shrew, &c. - - -	276
CHINESE EMPIRE AND JAPAN.—Map of - - - - - - - - - -	307
CLOCK.—Clock Movements, Water Clock, &c. - - - - - - - - - - -	394
CLOUDS.—Various Formations of, and Waterspout - - - - - - - - -	400
CARNIVOROUS PLANTS, in Colour - - - - - - - - - - - -	457

SELECT PRONOUNCING LIST
OF ENTRIES IN VOL. III.

Key: ā as in fate or in fare, ä as in far (sometimes short, sometimes long), a as in fat, ą as in fall; ē as in me, e as in met, ė as in her; ī as in pine, i as in pin; ō as in note, o as in not, o as in move; ū as in tube, u as in tub, ų as in bull, ü, the French u (sometimes short, sometimes long); ou as in pound; ch as in chain; *h* as in Scotch loch, German nach; ñ as in French ton; th as in thin; *th* as in this; w and y always consonants; zh as z in azure or j in French jaune.

Caama, kȧ'ma
Cabal, ka-bal'
Cabala, kab'a-la
Caballero, ka-bȧ-lyer'ō
Cabanis, kab'anis
Cabral, ka-brȧl'
Cabul, ka-bųl'
Cacao, ka-ka'ō
Caceres, kä'the-res
Cachalot, kash'a-lot
Cachar, ka-chär'
Cache, kȧsh
Cachet, kä-shā
Cachexy, ka-kek'si
Cachoeira, ka-sho-ā'i-ra
Cacholong, kash'o-long
Cachou, ka-sho'
Cachuca, ka-cho'ka
Cacique, ka-sēk'
Cadet de Vaux, ka-dā dė vō
Cadet-Gassicourt, ka-dā-gas-i-kor
Cadiz, ka-deth'
Cadore, ka dō'rā
Cadre, ka'dr
Cædmon, kad'mon
Caen, kañ
Cæsarea, sē-za-rē'a
Cagli, kal'yė
Cagliari, kal'ya-rē
Cagliostro, kal-yos'trō
Cagnoli, kän'yō-lē
Cagots, ka'gōz
Cahir, kā'ėr
Cahors, ka-ōr
Caicos, kī'kōz
Caique, ka-ēk'
Ça-ira, sa-ē-rä
Cairnes, kernz
Cairo (Egypt), kī'rō
Cairo (U.S.A.), kā'rō
Caius, kēz
Caivano, kī-va'nō
Cajamarca, ka-*h*a-mȧr'kä
Cajetan, caj'etan or ka'ye-tan
Calaba, kal'a ba
Calabozo, ka-lȧ-bō'thō
Calahorra, ka-lȧ-or'rä
Calais, ka-lā
Calamianes, kä-lä-mē-ä'nez
Calas, ka-la
Calatafimi, ka-lȧ-ta-fē'mē
Calatayud, kȧ-lä-tä-yųd'
Caldara, kȧl-dȧ'rȧ
Calderon, kal-de-ron'
Calendula, ka-len'dū-la
Calhoun, kal-hon'
Caligula, ka-lig'ū-la
Callao, käl-ya'ō
Callernish, kal'ėr-nish
Callichthys, kal-ik'this
Callimachus, kal'lim-a-kus
Calliope, kal-lī'ō-pē
Callisthenes, kal-lis'then-ēz
Callot, kal-ō
Calmet, kȧl-mā
Calne, kän
Calonne kä-lon'
Calophyllum, ka-lo-fil'lum
Calotropis, ka-lot'ro-pis
Calotte, ka-lot'
Caltagirone, kȧl-ta-jē-rō'nā
Calvados, käl-vȧ-dos
Calvaert, käl-vȧrt'
Calypso, ka-lip'sō
Camaiēu, ka-mā'ū
Camargue, kä-märg
Cambacérès, kañ-bä-sā-rā
Cambrai, käñ-brā
Cambridge, kām'brij
Cambyses, kam-bī'sēz
Camellia, ka-mel'ya
Camerino, ka-me-rē'nō
Campagna, kam-pan'yä
Campanile, kam-pa-nē'la
Campanula, kam-pan'u-la
Campbell, kam'bel
Campeachy, kam'pē-chi
Camuccini, kä-mųt-chē'nē
Canaan, kā'nan
Canara, kä'na-ra
Canaster, ka-nas'ter
Cancale, kañ-käl
Canea, ka-ne'a
Canephorus, ka-nef'o-rus
Canes Venatici, ka'nez vē-nat'i-sī
Cannes, kan
Cannstadt, kan'stat
Cañons, kan-yonz'
Canopus, ka-nō'pus
Canrobert, kañ-rō-bār
Cantabile, kan-tab'i-le
Cantabri, kan'ta-bri
Cantal, käñ-tal
Cantaloupe, kan'ta-lop
Cantaro, kan'ta-rō
Cantata, kan-tä'ta
Canton (city), kan-ton'
Cantyre, kan-tīr'
Canute, ka-nūt'
Canzone, kan-tsō'nā
Caoutchouc, ko'chok or kou'chok
Capefigue, kap-fēg
Capernaum, ka-per'nā-um
Capet, kä'pet
Capitanis, ka-pi-tȧ'niz
Caponiere, kap-o-neer'
Cappagh, kap'a*h*
Capraja, ka-pra'ya
Capriccio, ka-prich'i-o
Capuchin, kap-ų-shēn'
Capybara, kap-i-bā'ra
Carabidæ, ka-rab'i-dē
Caracas, ka-rak'as
Caracci, ka-rat'chē
Caraccioli, ka-rat'cho-lē
Caractacus, ka-rak'ta-kus
Carambola, ka-ram'bo-la
Carapa, ka-ra'pä
Caravaggio, ka-rä-vȧj'ō
Caravellas, ka-ra-vel'las
Carcagente, kar-ka-*h*en'tā
Cardamine, kar-da-mī'nē
Cardenas, kar-dā'nȧs
Carditis, kar-dī'tis
Carew, ka-ro'
Cargill, kar-gil'
Cariaco, kȧ-ri-ȧ'kō
Cariacou, ka'ri-a-ko
Caries, kā'ri-ēz
Carignano, kä-rē-nyä'nō
Carita, ka-rē-ta'
Carlen, kar-len'
Carlisle, kar-līl'
Carlos, kȧr-los'
Carlowitz, kar'lo-vits
Carlsbad, kȧrls'bät
Carlshamn, kȧrls'hȧm
Carlsruhe, kȧrlz'rȯ
Carlstadt, kȧrl'stat
Carlyle, kar-līl'
Carmagnola, kär-mä-nyō'la
Carmagnole, kȧr-ma-nyōl'
Carnatic, kȧr-nat'ik
Carnauba, kȧr-nȧ-o'ba
Carneades, kar-nē'a-dēz
Carniola, kar-ni-ō'lä
Carnot, kȧr-nō
Carolus, kar'o-lus
Carotid, ka-rō'tid
Carouge, ka-rozh
Carpaccio, kar-pat'chō
Carpentras, kar-pañ-tra
Carpinus, kar-pī'nus
Carracci, kar-rat'chō
Carrageen, kar'ra-gēn
Carrier, kar-yā
Carrousel, kar-o-zel
Cartagena, kar-ta-*h*ā'na
Cartagō, kar-ta'go
Carte-blanche, kart-bläñsh
Carte-de-visite, kart-dė vi-zet'
Carthage, kar'thāj
Carthagena, kar-tha-jē'na
Carthamus, kar'tha-mus
Cartier, kär-tyā
Cartouche, kar'tosh
Carupano, ka-ro'pa-nō
Carus, kä'rųs
Carvin, kar-vañ
Caryatides, ka-ri-at'i-dēz
Casale, ka-sa'lā
Casaubon, ka-zo'boñ
Casein, ka'se-in
Cashew, ka-sho'
Cassagnac, kas-an-yak
Cassano, kas-sa'nō
Cassava, kas-sa'va
Cassiodorus, kas-si-o-dō'rus
Cassiopeia, kas-si-ō pe'ya
Cassiquiare, ka-sēk-i-a'rē
Cassiterides, kas-i-ter'i-dēz
Cassiterite, kas-sit'er-īt
Castelar, kas-te-lar'
Castellamare, kas-tel-lä-mä'ra
Castellon-de-la-Plana, kas-tel-yon'
Castiglione, kas-tēl-yō'na
Castile, kas-tēl'
Castillejo, käs-tēl-yā'*h*ō
Castlereagh, kas'l-rā
Castres, kȧstr
Castro-Giovanni, kas'trō-jo-vȧn'ne
Castuera, käs-tų-ā'ra
Casuarina, kas-ū-a-rī'na
Catachresis, kat-a-krē'sis
Catalysis, ka-tal'i-sis
Catanzaro, kȧ-tan-za'rō
Câteau-Cambrésis, ka-tō-kañ-brā-sis
Catechu, kat'e-sho
Catechumens, kat-e-kū'menz
Cathari, kath'a-rī
Cathay, ka-thā'
Catinat, kä-ti-nȧ
Cattaro, kȧt'ta-rō
Caudebec, kōd-bek
Caudebec-les-Elbeuf, lā zel-bėf
Cauterets, kōt-rā
Cavaignac, ka-van-yäk
Cavaillon, ka-va-yōñ
Cavalier (French), ka-vä-lyā
Cavan, kav'an
Cavatina, kav-a-tē'na
Caviare, kav'i-ār
Cavite, kä-vē'tā
Cavo-rilievo, kä-vō-rēl-yā'vō
Cavour, kä-vȯr'
Caxamarca, kä-*h*ä-mȧr'ka
Caxias, ka-shē'as
Cayenne, kī-en'
Caylus, kā-lüs
Cayuga, ka-yo'ga
Cazalla-de-la-Sierra, ka-thal'ya
Cazembe, ka-zem'be
Cazorla, ka-thor'la
Cazotte, ka-zot
Ceará, sā-ȧ-ra'
Cebu, thā-bo'
Cecco d'Ascoli, chek-ō-das'ko lē
Cecil, ses'il
Cedrela, se-drē'la
Cefalu, chef'a-lo
Celano, che-lä'nō
Celebes, sel e-bēz
Celeres, sel'e-rēz
Celestine, sel'es-tin
Celle, tsel'le
Cellini, chel-lē'nē
Celtiberi, sel-ti-bē'rī
Cenci, chen'che
Cenis, sė-nē'
Centiare, sañ-tyar
Centime, sañ-tēm
Centuripe, chen-tö'ri pā
Cephaëlis, se-fā'e-lis
Cephalopoda, se-fa-lop'o-da
Cepheus, sē'fus
Ceram, se-ram'
Cerasus, ser'a-sus
Ceratodus, se-rat'o-dus
Cercopithecus, ser-ko-pi-thē'kus
Cerdic, ker'dik
Cere, sēr
Ceres, sē'rēz
Cerignola, cher-ē-nyō'la
Cerigo, cher-ē'gō
Ceroxylon, se-rok'si-lon
Cerreto, cher-rā'tō
Certaldo, cher-tal'dō
Certosa di Pavia, cher-tō'sa
Ceruse, sē'rųs
Cerutti, chā-rot'tē
Cervantes Saavedra, ther-van'tes sä-ä-vā'dra
Cervetri, cher-vā'trē
Cervin, ser-vañ
Cesarotti, che-sa-rot'tē
Cesena, che-sā'na
Cespedes, thes'pe des
Ceterach, set'ėr-ak
Cetewayo, kech-wā'ō
Cette, set
Cettigné, chet-in'yā
Ceuta, su'ta
Cevennes, se-venz'
Ceylon, si-lon'
Chabert, sha-bār
Chablais, sha-blā
Chablis, sha-blē
Chabot, shȧ-bō
Chæronea, kē-ro-nē'a
Chagos, chä'gōs
Chagres, cha'gres
Chaillot, sha-yō
Chalcedon, kal sē'don
Chalcedony, kal-sed'o-ni
Chalchondylas, kal-kon'di-las
Chalcis, kal'sis
Chaleur, sha-lor'
Challis, shal'i
Chalmers, cha mėrz
Châlon-sur-Saône, shä-lōñ-sür-sōn
Chalybeate, ka-lib'ē-āt
Chalybite, kal'i-bīt
Chama, kā'ma
Chamærops, ka-mē'rops
Chamalari, cham'a-la-rē

Chambertin, shäṅ-ber-toṅ
Chambery, shäṅ-bā-ri
Chambord, shäṅ-bōr
Chambre Ardente, shaṅ-br-är-däṅt
Chameleon, ka-mē'li-on
Chamfort, shaṅ-fōr
Chamier, sham'i-ėr
Chamisso, shȧ-mis'ō
Chamois, sham'wȧ
Chamomile, kam'o-mīl
Chamond, shä-mōṅ
Chamonix, shä-mo-nē
Champagne, shaṅ-pany
Champagne (wine), sham-pān'
Champ-de-Mars, shäṅ-dė-
Champeaux, shäṅ-pō [mars
Champignon, sham-pin'yon
Champlain (lake), sham-plān'
Champlain (person), shäṅ-plaṅ
Champollion, shäṅ-pol-yōṅ
Champollion-Figeac, fē-zhȧk
Chanda, chan-dȧ'
Chandausi, chan-dou-sē'
Chandhairee, chan-dā'rē
Chandernagore, chan'der-na-
Channing, chan'ing [gor
Chanterelle, shan-tėr-el'
Chantilly, shaṅ-tē-yē
Chapala, chȧ-pa'lä
Chapelain, shäp-laṅ
Chappe, shäp
Chapra, chup-rä'
Chaptal, shȧp-täl
Characeæ, ka-rā'se-ē
Charas, cha'ras
Chardin, shar-daṅ
Charente, sha-raṅt [ri-ėr
Charente Inférieure, aṅ-fā-
Charenton-le-Pont, sha-räṅ-tōṅ-l-pōṅ
Chargé-d'Affaires, shär-zhā-
Charites, kar'i-tēz [däf-är
Charkov, ħar'kof
Charlemagne, sharl-ė-mān'
Charlemont, sharl-mōṅ
Charleroi, shȧrl-rwa
Charleville, sharl-vēl [bụrħ
Charlottenburg, shär-lot'en-
Charlotte-russe, shar-lot-rụs
Charon, kā'ron
Charpie, shar'pē
Charqui, char'kē
Chartier, shar-tyā
Chartres, shartr
Chartreuse, shar-trėz
Charybdis, ka-rib'dis
Chasidim, ħas'i-dēm
Chassepot, shȧs-pō
Chasseur, shas-ėr
Chastelard, shat-lar
Château, sha-tō
Châteaubriand, sha-tō-brē-aṅ
Châteaudun, shȧ-tō-duṅ [yar
Château-Gaillard, sha-tō-ga
Château-Gontier, sha-tō-goṅ-tyā
Châteauneuf - de - Randon, sha-tō-nėf-dė-räṅ-dōṅ
Châteauroux, shȧ-tō-ro [rē
Château-Thierry, shä-tō-ti-ā-
Châtelet, shȧt-lā
Châtelherault, shȧ-tel-rō
Chatham, chat'am
Chati, chȧ'tē [yōṅ-sür-sen
Châtillon - sur - Seine, shȧ-tē-
Châtre, shȧ-tr [tān
Chaudefontaine, shōd - foṅ -
Chaudes-Aigues, shōd-āg
Chaudet, shō-dā
Chaudière, shōd-yār
Chaudon, shō-dōn
Chauffepié, shōf-pē-ā
Chaulieu, shō-lyė
Chaumont, sho-mōṅ
Chaumontelle, shō-moṅ-tel'
Chauny, shō-nė
Chaus, kā'us
Chausses, shōs
Chautauqua, chạ-tạ'kwa
Chauvinism, shō'vin-izm
Chaux-de-Fonds, shō-dė-fōṅ
Chavica, chav'i-ka
Chay-root, shā

Cheduba, che-dȯ'ba
Cheilognatha, kī-log'na-tha
Cheilopoda, kī-lop'o-da
Cheiranthus, kī-ran'thus
Cheirolepis, kī-rol'e-pis
Cheiromancy, kī'ro-man-si
Cheiromys, kī'ro-mis
Cheiron, kī-ron
Cheironectes, kī-rō-nek'tēz
Cheiroptera, kī-rop'te-ra
Cheirotherium, kī-rō-thē'ri-
Chelæ, kē'lē [um
Chelidonium, kel-i-dō'ni-um
Chelone, ke-lō'nē
Chelsea, chel'sē
Cheltenham, chel'tn-am
Chemnitz, ħem'nits
Chemosh, kē'mosh
Chemosis, kē-mō'sis
Chemulpo, chē-mul'pō
Chenab, chen-äb'
Chénier, shā-nyā
Chenille, she-nil'
Chénonceaux, shā-noṅ-sō
Chenopodium, kē-no-pod'i-
Cheops, kē'ops [um
Chephren, kef'ren
Cher, shār
Cherasco, kā-ras'kō
Cherbourg, shār-bor
Cheribon, sher'i-bon
Cherimoyer, cher'i-moi-ėr
Cherokees, cher-o-kēz'
Cheroot, she-rȯt'
Cherso, ker'so
Cherson, ħer'son
Chersonesus, ker-so-nē'sus
Cherubini, ke-rụ-bē'nē
Cherusci, ke-rus'sī
Cheselden, che'sel-den
Chetah, chē'tȧ
Chettik, chet'ik
Chetvert, chet'vert
Cheval, À, a shė-val
Chevalier, shė-val-yā
Chevaux de Frise, shė-vō' dė
Chevreul, shė-vrėl [frēz
Cheyenne, shī-yen'
Chiabrera, ki-ȧ-brā'ra
Chiana, kya'na
Chian (turpentine), kī'an
Chianti, ki-an'tē
Chiapas, chi-a'pas
Chiaramonte, kya-ra-mon'tā
Chiari, ki-a'rē
Chiaroscuro, ki-ä-rō-skȯ'rō
Chiastolite, kī-as'tō-līt
Chiavari, ki-a'vȧ-rē
Chiavenna, ki-a-ven'na
Chibouque, shi-bok'
Chica, chē'ka
Chicago, shi-kạ'gō
Chichen, chē-chen'
Chiclana, chi-kla'na
Chiem-See, ħēm-za
Chieri, ki-ā'rē
Chieti, ki-ā'tē
Chignon, shēn-yōṅ
Chigoe, chig'ō
Chih-le, chi-lē
Chihuahua, chē-wa'wȧ
Chili, Chile, chē'lē, chē'lā
Chillan, chil-yan'
Chillicothe, chil-i-koth'e
Chillon, shē-yōṅ
Chilo, kī lō
Chiloé, chēl-wā'
Chilon, kī'lon
Chimæra, ki-mē'ra
Chimborazo, chim-bo-rā'zō
Chimere, shi-mēr'
Chimpanzee, chim-pan'zē
Chinandega, chē-nän-dā'gȧ
Chincha, chin'cha [chil'la
Chinchilla (animal), chin-
Chinchilla (town), chin-chēl'
Chinchona, chin-chō'na [ya
Chingleput, ching'gl-put
Chinoline, kin'o-lin
Chinon, chē-nōṅ
Chinsurah, chin-sȯ'rä
Chio, kē'o
Chiococca, kī-ō-kok'ka
Chioggia, ki-od'jä
Chios, kī'os
Chippeways, chip'e-wāz

Chiquimula, chi-ki-mȯ'lä
Chiquitos, chi-kē'tōs
Chiragra, kī-rag'ra
Chiretta, ki-ret'ta
Chiriqui, chi-ri-kē'
Chiromancy, kī'ro-man-si
Chiron, kī'ron
Chiru, chē'rö
Chisleu, kis'lū
Chiswick, chis'ik
Chitaldrug, chit-al-drog'
Chitin, kī'tin
Chitons, kī'tonz
Chitral, chi-tral'
Chittoor, chit-tör'
Chiusa, ki-ö'sȧ
Chiusi, ki-ö'sē
Chivasso, kē-vȧs'sō
Chive, Cive, chīv, sīv
Chladni, ħläd'nē
Chlamyphorus, kla-mif'o-rus
Chlamys, klam'is
Chlorosis, chlo-rō'sis
Chocho, chō'chō
Choczim, ħo'tsim
Chœrilus, kē'ri-lus
Choiseul, shwa-sėl
Choisy-le-Roi, shwä-sē-l-rwa
Cholagogue, kō'la-gōg
Cholesterin, kō-les'tėr-in
Cholet, sho-lā
Cholochrome, kō'lo-krōm
Cholos, chō'lōs
Cholula, chō-lo'lȧ
Chondrite, kon'drīt
Chondropterygii, kon-drop-
Chonos, chō'nōs [te-rij'i-ī
Chopin (F. F.), sho-paṅ
Chopine, cho-pēn'
Choragic, ko-rā'jik
Choragus, ko-rā'gus
Chorale, ko-rā'le
Chorea, ko-rō'a
Choriambus, ko'ri-am-bus
Chorion, ko'ri-on
Chorley, chor'li
Choroid, kō'roid
Chose, shōz
Chosroes, kos'ro-es
Chotin, ħō'tin
Chouans, sho-ȧṅ
Chough, chuf
Chrétien de Troyes, krā'ti-aṅ dė trwä
Christians-öe, kris'tyanz-ė-e
Christophe, kris'tof
Christopulos, kris-to-po'los
Chrudim, ħro'dim [mum
Chrysanthemum, kri-san'the-
Chrysippus, kri-sip'pus
Chrysoloras, kris-o-lō'ras
Chrysostom, kris'os-tom
Chunam, chụ-nam'
Chunar, chu-när'
Chuprah, chup-rä'
Chuquisaca, cho-kē-sä'ka
Chur, ħor
Churubusco, chụ-rụ-bụs'kō
Chusan, cho'san
Cicada, si-kā'da
Cicala, chi-kä'la
Cicely, sis'e-li
Cicindela, sı-sin-dē'la
Cienfuegos, thē-en-fụ-ā'gōs
Cieza, thē-ā'thȧ
Cignani, chē-nyȧ'nē
Cigoli, chē'go-lē
Cimabue, chē-mȧ-bȯ'ā
Cimarosa, chē-mä-rō'sȧ
Cimbri, sim'brī
Cimolos, si-mō'los [chō'na
Cinchona, sin-kō'na or sin-
Cincinnati, sin-sin-ä'tē [mum
Cinnamomum, sin-na-mō'-
Cinq-Mars, saṅk-märs
Cinque-cento, chēn'kwā-chen-tō
Cinque-foil, singk'foil
Cione, chi-ō'nā
Ciotat, sē-ō-tä
Cipriani, chē-prē-ä'nē
Circe, sėr'sē
Cirencester, sis'e-tėr
Cirrhipedes, sir'i-pēdz
Cirrhosis, sir-rō'sis
Citeaux, sē-tō

Cithæron, si-thē'ron
Cittadella, chēt-tä'del-lä
Città-Vecchia, chēt-tä-vek'i-ȧ
Ciudad, thi-ö-däd'
Ciudad Bolivar, thi-ö-däd bo-lē'var
Ciudadela, thi-ö-dȧ-dā'lä
Ciudad-Real, thi-ö-dȧd' rā-äl'
Ciudad-Rodrigo, thi-ö-dȧd'-rod-rē'gō
Cividale, chē-vē-dä'lā
Civita, chē'vē-tä
Civitanova, chē-vē-tä-nō'vȧ
Civita Vecchia, chē-vē-tä
Clairac, klā-räk [vek'i-ȧ
Clairaut, klā-rō
Clairvaux, klār-vō
Clamecy, klȧm-sē
Claqueurs, klȧ-kėrz
Claude, klōd
Clavigero, klä-vi-ħā'rō
Clavijo y Flajardo, klȧ-vē'ħō ē flȧ-ħär'dō
Cleckheaton, klēk-hē'ton
Cleef, klāf
Clematis, klem'a-tis
Clément (Fr.), klā-mȧṅ
Clementi, kle-men'tē
Cleobulus, kle-o-bo'lus
Cleomenes, kle-om'e-nēz
Clepsydra, clep'si-dra
Clermont-de-Lodève, klār-mōṅ-d-lo-dāv
Clermont-en-Beauvoisis klār-mōṅ-tȧṅ-bō-vwä-sē
Clermont-Ferrand, klār-mōṅ-fār-äṅ
Clermont-Tonnerre, klār-
Cleves, klēvz [mōṅ-ton-nār
Cliché, klē-shā
Clichy, klē-shē
Clitheroe, klith'e-rō
Cloaca, klo-ā'ka
Clogher, klō'gėr
Cloisonné, klwa-son-ā
Clonmel, klon-mel'
Clontarf, klon-tarf'
Cloots, klōts
Cloud (town), klȯ
Clough, kluf
Cluny, klu-nē
Clupeidæ, klo-pē'i-dē
Clwyd, klụ'id
Clyde, klīd
Coahuela, kō-ȧ-wē'lȧ
Coati, kō'a-ti
Coban, ko-bȧn'
Cobija, kō-bē'ħä
Coblentz, kob'lentz
Coburg, ko'bụrg
Cocaine, kō'ka-in
Coccyx, kok'siks
Cochabamba, koch-ȧ-bam'ba
Cochineal, koch'in-ēl
Cochlea, kok'lē-a
Cochlearia, kok-lē-ā'ri-a
Cockburn, ko'burn
Codeine, kō-dē'in
Codogno, ko-dōn'yō
Coehorn, kō'horn
Cœlenterata, sē-len-tėr-ā'ta
Coethen, kė'ten
Cognac, kon-yak
Cognovit, kog-nō'vit
Cohoes, ko-hōz'
Cohune, ko-hūn'
Coimbatore, ko-im-ba-tōr'
Coimbra, ko-im'bra
Coin, ko-in'
Coire, kwȧr
Colbert, kol-bār
Colchicin, kol'ki-sin
Colchicum, kol'ki-kum
Colchis, kol'kis
Colcothar, kol'ko-thȧr
Coleoptera, ko-lē-op'te-ra
Coleraine, kōl-rān'
Coleridge, kōl'rij
Colibri, kol'i-bri
Coligny, kol-in-yē
Colima, kō-lē'mä [bwä
Collot D'Herbois, ko-lō-dār-
Collyrium, kol-lir'i-um
Colne, kōln
Cologne, ko-lōn'
Colon (town), ko-lon'

THE NEW

POPULAR ENCYCLOPEDIA

A DICTIONARY OF GENERAL KNOWLEDGE

C, the third letter of the English alphabet and in others derived from the Latin. 'In English', says Ben Jonson, 'it might well have been spared, for it has no peculiar sound.' It has the simple power of *k* before *a*, *o*, *u*, and most of the consonants; and the power of *s* before *e*, *i*, *y*. With *h* it forms the digraph *ch*, which in genuine English words is usually pronounced as in *child*, *chin* (a sound that might be written *tsh*); otherwise it may be pronounced like *k*, as in *chord*, *architect*; or even as *sh*, as in *machine*. In various Scotch words, such as *loch*, and also in German, *ch* has a peculiar guttural sound. In Latin *c* seems to have had originally the sound of *g* hard, but in the classical period it had the sound of *k*, and this even before *e* and *i* (*Cicero* = *Kikero*). In the Anglo-Saxon alphabet it also had this sound, and the change of pronunciation in such words as *chin* = A. Sax. *cin* (pron. *kin*), *child* = A. Sax. *cild* (pron. *kild*), is similar to what has taken place in Italian as compared with Latin, the Italian *c* before *e* and *i* being pronounced as *ch* in *child*. In Spanish, again, before *e* and *i* it has the sound of English *th* in *thin*. It does not occur alone as a final consonant in purely English words, but often along with *k*, as in *thick*, &c. Its principal uses in ordinary English abbreviations have been explained in the article ABBREVIATIONS. On Roman coins and medals it stands for various personal names, as *Cæsar*, *Caius*, *Cassius*, &c.; or for names of offices, as *censor*, *consul*; also for *civitas*, *colonia*, *cohors*, &c.

C, in music, the name of the first or key-note in the modern normal scale, answering to the note to which Guido applied the monosyllable *ut*, a name which has long been relinquished by the Italians for that of *do*, as softer and more vocal, though *ut* is still used in France. It stands, likewise, when placed at the clef, for 'common time'. See MUSIC.

CAAING WHALE (*Globiocephalus deductor* or *melas*), a mammal belonging to the order Cetacea or whales, sometimes made a separate genus, and sometimes considered as belonging to the same genus with dolphins and porpoises. It is from 16 to 24 feet in length, 10 feet in diameter at its thickest part, and as much as 50 cwts. in weight. Its pectoral fins are about 5 feet long and 1½ foot broad, and its dorsal fin is very low. With the exception of a white streak, which begins in the form of a heart under the throat and gradually narrows to the vent, the whole of the body is of a glossy black colour, and hence the fish is frequently known as the 'black fish' or 'black dolphin'. The teeth are arranged at considerable distances in the upper and under jaw in such a manner that those of the upper jaw fit into the spaces left in the lower jaw, and reversely. Their number is very variable. They are conical in shape, strong, rather long, and end in a point which is a little curved backwards and inwards. The caaing whale is very abundant and very widely distributed. It is found in the whole of the Arctic Ocean, and also in the German, Atlantic, and Pacific oceans, and even in the Mediterranean Sea. It is remarkable for its gregarious habits, being often found in 'schools' numbering several hundreds, which are led by an old and experienced male whom, it is said, they never abandon. On this account its pursuers always endeavour to force the leader on shore, and when this is accomplished all the rest follow him and are likewise stranded—hence the name 'caaing', in Scotch equivalent to 'driving'. In the stomach of these animals are usually found the remains of cod-fishes and various species of cuttle-fish, as well as of herrings, ling, and other fishes. The caaing whale is pursued chiefly on account of the oil which it yields.

CAB, a carriage with two or four wheels, usually drawn by one horse, and plying for hire; a hackney-carriage. One well-known two-wheeled variety is the hansom, named after the inventor. Public cabriolets—hooded chaises carrying one person besides the driver—were introduced in London in 1823, and the name was soon after shortened to cab. See COACH, HACKNEY-CARRIAGE.

CABAL, in English history applied to the ministry under Charles II., which consisted of five men famous for their intrigues—Clifford, Ashley, Buckingham, Arlington, and Lauderdale, whose initial letters form this word (Burnet, Own Times, an. 1672). The use of this word to signify a body of intriguers was not, however, derived from this circumstance, as some have supposed, for the word *cabale*, derived from *cabala* (see next article), was used in that sense in French before this time (for example, by Molière). 'Never', says Hume, 'was there a more dangerous ministry in England, nor one more noted for pernicious counsels. Ashley (more known as the Earl of Shaftesbury), bold, ambitious, eloquent, insinuating, subtle, united great industry with a sound judgment of business and of men. Buckingham, with the advantages of a graceful person, high rank, splendid fortune, and a lively wit, but without prudence or principle, sacrificing in turn honour to interest, interest to pleasure, and pleasure to caprice, dissipated his fortune and ruined his health by his riot and debauchery, and destroyed his character in public life by his want of secrecy and constancy. Lauderdale, tyrannical, ambitious, implacable, insolent, yet abject, had a great ascendency over the king. Clifford, daring, impetuous, yet artful and eloquent, and Arlington, of moderate capacity, without courage or integrity, were secretly Catholics. Shaftesbury was at once a Deist and addicted to astrology; Lauderdale, a bigoted, and earlier, a furious Presbyterian.'

CABALA, or Cabbala (that is, *reception*), is used by the Jews to denote sometimes the traditions of their ancestors regarding the interpretation of the Scriptures; sometimes, and most commonly, their mystical philosophy. The opinions of scholars respecting the origin of the cabalistic philosophy are very various. The Jews derive the cabala from the most ancient times of their nation, nay, even from Adam himself. But cabalistic doctrines in reality seem to have had their origin about 200 years before Christ, and were derived from the mingling of oriental ideas with those belonging to the Mosaic religion that was the result of the captivity. It was long before the cabala reached its full development, however, the chief landmarks in its history being the writings of Philo Judæus and the appearance of the books called the Jezirah and the Sohar. The age of both is doubtful. The earliest probable date for the Jezirah is the beginning of our era. The earliest mention of the Sohar is in 1290, and the author is not supposed to have lived much before 1000. The cabala is divided into the symbolical and the real. The symbolical portion treats principally of letters, to which it gives mystical significations. The real, which is opposed to the symbolical, and comprehends doctrines, is divided into the theoretical and practical. The aim of the theoretical is to explain the Holy Scriptures according to the secret traditions, and to form therefrom a philosophical system of metaphysics, physics, and pneumatology. The practical portion, on the other hand, pretends to teach the art of performing miracles, and that merely by an artificial application of the divine names and sentences in the Sacred Scriptures. After the revival of science many scholars studied the cabala. The most famous modern cabalists are Henry More and Christian Knorr, the latter of whom published a compilation of the most important parts of the cabalistic writings in Latin (1677). See Dr. Ginsburg, The Kabbalah (1865).

CABANIS, Peter John George, physician, philosopher, and *littérateur*, was born at Cognac in 1757, went to Paris in his fourteenth year, and devoted himself with zeal to the sciences. In his sixteenth year he went to Warsaw as secretary of a Polish lord. The proceedings of the stormy diet of 1773 filled him with melancholy and contempt of mankind. He began at Paris a complete translation of the Iliad. In Auteuil, near Paris, he became acquainted with Madame Helvetius, and through her with Holbach, Franklin, and Jefferson, and became the friend of Condillac, Turgot, and Thomas. In his Serment d'un Médecin he formally took leave of the belles-lettres. He professed the principles of the revolution, and was intimately connected with Mirabeau, who made use of his ideas, and obtained from him the work on public education which Cabanis published himself in 1791, after the death of Mirabeau. He lived in still closer intimacy with Condorcet. At the time of his death, May 5, 1808, he was a member of the Senate. His Rapports du Physique et du Moral de l'Homme (Paris, 1802, two vols., improved in 1805) is his most important work. It displays considerable power of analysis, and advocates the most extreme materialistic doctrines.

CABBAGE. The cabbage is a biennial plant, too well known to need description, and constitutes one of our most valuable classes of vegetables. The *Brassica oleracea*, the original species from which the numerous varieties of cultivated cabbages are derived, although in a wild state very remote in appearance from the full, round head which our plants present, is scarcely more so than the kale, cauliflower, broccoli, &c., all of which belong to the same family. In general terms, we may consider this plant as divided into three classes—the common-headed cabbage of the field and garden; the cauliflower, broccoli, &c., which form their stalks into a loose head; and the kale, colewort, &c., which grow in a natural branching way, without forming any heads at all. Of these, the common cabbage is by far the most valuable, both to man and to the beasts by whose assistance he is able to make the earth so fertile. It is also the most productive; for it is believed that an acre of ground will yield a greater weight of green vegetable matter (and thus be more profitable to the farmer), in the shape of cabbage, than in that of any other vegetable whatever. It is very abundantly produced by clay soils which are unfit for turnips, and the farmers who cultivate such soils will find it a vegetable worthy of much attention. The cabbage furnishes green fodder for cows and sheep, which is, at least, as good as turnips or carrots, fattening the animals equally fast, and rendering their milk, butter, &c., to the full as sweet; and is so far preferable, as it keeps later in the spring, and thus supplies green food when no other can be procured. It is eaten by men in three forms, all of which have their admirers, but which vary much in respect to their wholesomeness and digestibility. These forms are—the sliced raw cabbage, plain boiled cabbage, and salted cabbage or sour-crout, the favourite dish of the whole German nation. In the first form, of raw cabbage, sliced fine, and eaten with vinegar, whether entirely cold, or hot enough merely to wilt the vegetable, it is one of the lightest and most wholesome articles of vegetable food, and in this shape will supply a green summer vegetable through the whole of the winter. Its use cannot be too highly recommended. Boiled cabbage takes longer to digest, and is more trying to a weak stomach. Sour-crout, or, properly, *sauerkraut*, is much eaten by the Germans, and they consider it very wholesome, although it is nearly, if not quite, as difficult of digestion as boiled cabbage. It is prepared in the following manner:—Cabbage is sliced up fine, and a layer of it placed in the bottom of a barrel, which is plentifully salted; it is then well bruised with a heavy mall or pestle, or is trodden down by a pair of heavy boots, till the barrel is half filled with the froth that arises from this operation. Successive layers of cabbage and salt are added in this manner, each receiving the same treatment, till the vessel is nearly full. Some cold water is then poured in, and the top of the barrel is pressed down with heavy stones. The contents undergo a brisk fermentation, which continues for a week or two, during which time the brine must be drawn off, and replaced by new, until it remains perfectly clear, when the process is finished. It must be kept covered with brine, and is thus simply a fermented, or half sour, salted mass of cabbage. The other forms of cabbage, as the cauliflower, &c., supply the epicures of all countries with some of their greatest delicacies, while the hardy kale, which endures all degrees of cold, affords the farmers of poor soils a valuable fodder for cattle of all kinds.

CABBAGE-BUTTERFLY, a name given to several species of butterfly, hence called Brassicariæ, which deposit their eggs on cabbage leaves (for example, *Pontia*, or *Pieris brassicæ*). See Butterfly.

CABBAGE-FLY (*Anthomyia brassicæ*), a species of insect (order Diptera) of the same order as the house-fly, the larvæ of which prey upon the roots of cabbages. The Anthomyiæ deposit their eggs in the earth, and the different species receive different names, according to the particular roots upon which the larvæ feed. Thus we have the potato-fly, the turnip-fly, &c.

CABBAGE-MOTH (*Noctua brassicæ*), a species of moth, the caterpillar of which preys on cabbage and turnip leaves.

CABBAGE-PALM, a name given to various species of palm-tree from the circumstance that the terminal bud, which is of great size, is edible and resembles cabbage, as the *Areca oleracea*, a native of the West Indies, the simple unbranched stem of which grows to a height of 150 or even 200 feet. It is crowned by a head of large pinnated leaves. The flowers are placed on a branching spadix and protected by a double spathe. The unopened bud of young leaves is much prized as a vegetable, but the removal of it completely destroys the tree, as it is unable to produce lateral buds. *Ptychosperma* (*Seaforthia*) *elegans* is the cabbage-palm of New South Wales. The name is also given to the *Euterpe montana* and the *Chamærops Palmetto.*

CABBALA. See CABALA.

CABELLO. See PORTO CABELLO.

CABES, or GABES, a town and port of the French protectorate of Tunis. It stands at the foot of the Jebel Hamarra, on the right bank of the Wad-er-rif, near the head of the Gulf of Cabes, and may be said to consist of several villages. It has some export trade in dates, henna, &c. The Gulf of Cabes (*Syrtis Minor*) has at its entrance the islands of Kerkenna and Jerba. Its chief seaport is Sfax. Pop. of Cabes, 10,000.

CABINET, a word of various meanings, one of which was formerly a private room, designed for work, or for collections of valuable articles. From the term having been frequently applied to the apartment in a monarch's residence where he transacts government business, advises with his privy-councillors, &c., it is now used for a government or ministry; thus we speak of the cabinet of London, of Vienna, &c. All those who may be called ministers, however, are not included in the cabinet, but sometimes more, sometimes fewer. Lord Salisbury's cabinet in 1900 included the premier (being also foreign secretary), the lord-chancellor, lord-president of the council, lord-privy-seal, chancellor of the exchequer, four secretaries of state, first lord of the admiralty, first lord of the treasury, lord-chancellor of Ireland, lord-lieutenant of Ireland, president of the board of trade, president of the local government board, chancellor of the Duchy of Lancaster, secretary for Scotland, first commissioner of works, and president of the board of agriculture.

CABIRI, sacred priests or deified heroes, venerated by the ancients as the authors of religion and the founders of the human race. The multiplicity of names applied to the same character, the interchange of the names of the deities themselves with those of their priests, the oracular law which enjoined the preservation of ancient barbaric names, and thus led to a double nomenclature, sacred and profane, together with the profound secrecy of the rites, have involved the subject in great obscurity. Some have thought that the eastern mythology and the Druidism of Western Europe contain traces of the Cabiri. Herodotus (ii. 51) says that their worship was brought to Samothrace by the Pelasgi. Strabo (x. 472) says they are the same as the Corybantes. Others have identified them with the Titans, the Dii Magni, the Penates, the Dioscuri, &c. Some say there were six, three male and three female, children of Vulcan and Cabira, daughter of Proteus. Others make two, sons of Jupiter or Bacchus. In Samothrace, four were venerated. In Egypt, their temple was never entered by any but the priests. In Phœnicia, Rome (where, according to Pausanias, they had an altar in the *Circus Maximus*), and other countries of Europe and Asia, traces of their worship are found. But the mysteries (*Cabiria*), celebrated at Samothrace were the most famous. The mysteries of Isis, Ceres, Mithras, Trophonius, Bacchus, Rhea, Adonis, Osiris, and all the similar customs of Egypt, Greece, Hindustan, and Britain, seem to be only varieties of the Samothracian rites, which were celebrated in the obscurity of night, and with the most profound secrecy Some tell us that after a previous probation the candidates for initiation were purified by water and blood, they then offered a sacrifice of a bull or ram, and were made to drink of two fountains, called *Lethe* (oblivion) and *Mnemosyne* (memory), to wash away the memory of their former guilt, and to enable them to remember the new instructions. They were then transported into a dark tower or cavern, where their ears were assailed by the most appalling sounds, the rushing of waters, the roar of thunder, dreadful yells, with occasional gleams of light flashing through the darkness, and displaying the most horrible phantoms, with a dead body exposed on a bier. Thus filled with terror, they were suddenly hurried into other scenes; light and cheerful music succeeded to darkness and the dismal sounds, the dead body revived, and the temple resounded with rejoicings. The hidden doctrines and secret rites were now communicated. Dances and orgies, in which the mystic *phallus*, corresponding to the lingam of the Hindus, was introduced, closed the ceremony. But all this is doubtful.

CABLE. 1. In architecture, a wreathed circular moulding resembling a rope; also, the staff which is left in the lower part of the flutings of some examples of the Corinthian and Composite orders. 2. In naval affairs, it is a long, thick rope, formed usually of three, sometimes of four strands of hemp, which is employed for confining a vessel to its place by means of an anchor or other fixed body. The long and heavy chains which are now so commonly employed for this purpose are also called *cables*. Large vessels have ready for service three cables—the *sheet* cable, the *best bower* cable, and the *small bower* cable. They should be at least 100 to 120 fathoms in length. A best bower cable, of 25 inches in circumference, is formed of 3240 threads. The invention of iron cables has supplanted those of hemp in ships of war, and to a great extent even in merchant ships. They are stronger, more durable, less liable to be destroyed on rocks, &c. It is sometimes desirable to cut the cable when of hemp: this contingency is provided for in iron cables by a bolt and shackle at short distances, so that, by striking out the bolt, the cable is easily detached.—*Cable's length* is the measure of 120 fathoms. See also ROPE, SUBMARINE CABLE, CHAINS.

CABOOSE, the cook-room or kitchen of a ship. In smaller vessels, the name is given not to a room but to an inclosed fireplace, hearth, or stove, for cooking on the main deck. The cook-room is also known as the *galley*.

CABOT, SEBASTIAN, a navigator of great eminence and abilities, was born at Bristol about the year 1474; other authorities say 1477. He was the son of John Cabot, a Venetian pilot, who resided at Bristol, and was highly esteemed for his skill in navigation. Sebastian was early instructed in the mathematical knowledge required by a seaman, and at the age of seventeen had made several voyages. In 1496 John Cabot obtained from Henry VII. letters patent empowering him and his three sons, Lewis, Sebastian, and Sanctius, to discover unknown lands, and conquer and settle them. In consequence of this permission the king supplied one ship, and the merchants of London and Bristol a few smaller ones, and John and Sebastian sailed to the N.W. In June, 1497, the coast of Newfoundland, or as some think of Labrador, was reached. The accounts of this voyage are attended with much obscurity; but a second patent was granted to John Cabot in 1498, and it seems that, in a subsequent voyage, the father and son sailed as far as Cape Florida, and were actually the first who saw the mainland of America. Little, however, is known of the proceedings of Sebastian Cabot for the ensuing twenty years; but it seems that, in the reign of Henry VIII., by the patronage of Sir Thomas Peart, vice-admiral of England, he procured another ship to make discoveries, and attempted a southern passage to the East Indies, in which he failed. This disappointment is supposed to have induced him to quit England and visit Spain, on the invitation of Ferdinand. The death of the king lost him his patron, and in a few years he returned to England, and was employed by Henry VIII. to find out the N.W. passage. After this expedition, which was on the whole unsuccessful, he again entered the Spanish service, and in 1526 he began a voyage which resulted in his reaching the river La Plata, where he discovered St. Salvador, and erected a fort there. He continued in the service of Spain for some years longer, but at length returned to England towards the latter end of the reign of Henry VIII. At the beginning of the reign of Edward VI. he was introduced by the protector Somerset to the young king, who settled a pension on him as grand-pilot of England. From this time he was consulted on all questions relating to trade and navigation; and in 1552, being governor of the company of merchant adventurers, he drew up instructions, and procured a license for an expedition to discover a passage to the East Indies by the N. These instructions, which are preserved in Hakluyt's Collection of Voyages, form a very honourable proof of his sagacity and penetration. He was also governor of the Russian company, and was very active in their affairs. He is supposed to have died in the year 1557, at a very advanced age, leaving behind him a high character both as a skilful seaman and a man of great general abilities. He was the first who noticed the variations of the compass; and besides the ordinances to be found in Hakluyt, he published a large map of the world, as also a work under the title of Navigazione nelle parti Septentrionali, per Sebastiano Cabota (folio, Venice, 1583). See a Memoir of his Life, published at London (1831, 8vo).

CABRA, a town of Southern Spain, in the province and 29 miles S.S.E. of Cordova, in a valley almost environed by mountains. It has wide streets; a large, irregular, but imposing-looking square; two large and handsome parish churches; a richly endowed college, &c. Pop. (1887), 13,390.

CABUL, CABOOL, KABUL, &c., capital of the kingdom of Afghanistan, is a very ancient city situated at the west extremity of a spacious plain, in an angle formed by the approach of two ranges of hills, and (with the exception of a suburb) on the right bank of the Cabul river, which is spanned, in or near the city, by four bridges. Cabul is distant about 175 miles from Peshawar (by the Khyber Pass), 316 from Kandahar, and 687 from Herat by Kandahar. It stands at the height of about 6000 feet above the sea, and has a delightful climate in summer, but the winter is severe. The houses are in general slightly built of mud and unburnt bricks, and there are no public buildings of any importance, though many of the mosques are spacious and commodious. Cabul is divided into quarters, and these into smaller sections, which are inclosed and entered by small gates, so that in time of war or tumult they can be converted into separate strongholds. There are hardly any proper streets in the city except those formed by the bazaars, which are extensive and well supplied with goods. A portion of one of the bazaars consists of four handsome covered arcades, separated by open squares and adorned with paintings. Cabul is now becoming an important centre of trade with India and Central Asia, and its population is greatly increased in the summer season by the influx of traders and others. It is supplied with water from the river Cabul, and also from wells. Various manufactures are carried on, but none are of special importance. The citadel of Cabul is the Bala Hissar or Upper Fort, situated on a spur of the adjacent hills. In it the Amirs used to reside, but the present Amir has his residence in the city itself. For the important events of which Cabul has recently been the scene see AFGHANISTAN. Estimated pop. 75,000.

CACAO, or COCOA, the name of several trees of the natural order Byttneriaceæ (which see), forming the genus Theobroma, the seeds of which furnish cocoa and chocolate, natives of the West Indies and South America. The chief is the *T. cacao,* which, both in size and shape, somewhat resembles a young cherry-tree, but separates near the ground into four or five stems. The leaves are about 4 inches in length, smooth but not glossy, and of a dull green colour. The flowers are saffron-coloured, and very beautiful. The fruit of the cacao-tree somewhat resembles a cucumber in shape, but is furrowed deeper on the sides. Its colour while growing is green; but as it ripens this changes to a fine bluish-red, almost purple, with pink veins; or, in some of the varieties, to a delicate yellow or lemon colour. Each of the pods contains from twenty to thirty nuts or kernels, which in shape are not much unlike almonds, and consist of a white and sweet pulpy substance, enveloped in a parchment-like shell. These are the cacao or chocolate nuts. Cacao is cultivated in the Antilles, in Mexico, Guatemala, Guiana, Venezuela, and also in Africa and Asia. The wild cacao-trees yield only one crop every year, between February and May; the cultivated trees yield a second crop in August and September. The plantations are usually in marshy situations. As soon as the fruit is ripe it is gathered and cut into slices, and the nuts, which are at this time in a pulpy state, are taken out, and laid in skins, or on leaves to be dried. They have now a sweetish acid taste, and may be eaten like any other fruit. When perfectly dry they are put into bags, each containing about 1 cwt., and, thus packed, are exported to foreign countries. Previously to being formed into chocolate these nuts are generally toasted or parched over the fire in an iron vessel, after which process their thin external covering is easily separated. The kernel is then pounded in a mortar, and subsequently ground on a smooth, warm stone. Sugar, and various kinds of spices, such as vanilla, cinnamon, cloves, long pepper, almonds, and other substances, are frequently added; and, with the aid of water, the whole is formed into a paste. This is put whilst hot into tin moulds, where in a short time it congeals; and in this state it is the chocolate of the shops. Very often the chocolate sold in the shops is adulterated with flour, starch, and other matters. The purest form in which cacao is sold is what is called *cocoa nibs,* which are the seeds or beans divested of their husks and broken by pressure. The common cocoa of the shops, which is more generally used than chocolate in Great Britain, is seldom pure. By the natives of South America the cacao beans are used for food. A white oily matter, about the consistence of suet, is also obtained by bruising them and boiling the pulp. The oil is by this means liquefied and rises to the surface, where it is left to cool and congeal, that it may the more easily be separated. This, which is called *butter of cacao,* is without smell, and when fresh has a very mild taste. Its principal use is as an ingredient in pomatums. From the nuts, when slightly roasted, an oil is sometimes obtained by pressure, which is occasionally used in medicine.

CÁCERES, a town of Spain, in Estremadura, capital of a province of same name, 24 miles W. by N. of Truxillo. It consists of an old and a new town, the former crowning the top of a hill, and surrounded by a strong wall flanked with towers, and the latter built round it on the lower slopes. The houses are tolerably well built, but the streets are mostly narrow and steep. Among the objects worthy of notice are four churches, several old feudal mansions, and the bull-ring. Pop. (1887), 14,880. Area of province, 7667 square miles; pop. (1887), 339,793.

CACHALOT. See SPERM-WHALE.

CACHAR, a district of Assam, India, bounded east by Manipur and the Naga Hills, south by the Lushai Hills, west by Sylhet and the Jaintia Hills, and north by Nowgong district. It comprises a series of fertile valleys diversified by low hills and almost surrounded by mountain ranges. The Barak river flows through the district, its course here being about 130 miles. Lignite and petroleum have been found. Salt is manufactured in small quantities. The forests are of great extent, and constitute the chief natural wealth of the district. Rice and tea are extensively cultivated. Area, 2472 square miles; pop. (1891), 367,542. The chief town is Silchar.

CACHET, LETTRES DE, secret warrants, by means of which, under the former kings of France and their ministers, any person could be imprisoned or banished to a certain place without any reason given. All despatches from the royal state chancery were issued either openly, as *lettres patentes*, or sealed, as *lettres closes*, or *de cachet*. The first were always written upon parchment, signed by the king, countersigned by a minister of state, stamped with the great seal of state, and not folded up. In this shape all edicts, ordinances, charters, privileges, &c., were issued, but all had to be registered by the parliament of the district to which they referred. The representations of the parliament often prevented these *lettres patentes* from being carried into effect. The others, the *lettres closes*, were written only on paper, some in the name of the king (who spoke in the first person, and concluded with the formula 'Sur ce je prie Dieu, qu'il vous ait dans sa sainte et divine garde', and signed with his name), some by commission from the king. In the latter case they began with the words 'De par le roi: il est ordonné à', and were signed by a minister. They were then closed and sealed with the small royal seal (*cachet*), so that the contents could not be seen. The *lettres closes* were used for many purposes besides that of arrests. All the orders sent to officers and private individuals were issued in this form. Warrants also were often issued in this form, because the courts, and particularly the police, could not have acted without such authority in urgent cases. To the *lieutenant-général* of the police of Paris a number of them were always given to fill out the blanks as occasion might require. Without them he would not have been authorized to arrest suspected persons. Frequently the arrest by *lettre de cachet* was a favour on the part of the king, as it withdrew the accused from the severer punishment to which he would have been liable upon a trial before the courts.

CACHOEIRA, a town of Brazil, in the state and 62 miles N.W. of Bahia. It stands on the Paraguassu, which divides it into two unequal parts and has often injured it by inundations, and is the entrepôt for the traffic of a large extent of surrounding country. The chief exports are coffee, cotton, and tobacco. Pop. 15,000.

CACHOLONG, a mineral of the quartz family, a variety of opal, and so often called *pearl-opal*. It is usually milk-white, sometimes grayish or yellowish white, opaque or slightly translucent at the edges. It often envelops common chalcedony, the two minerals being united by insensible shades. It also associates with flint and semi-opal.

CACIQUE, in some parts of America the title of the native chiefs at the time of the conquest by the Spaniards.

CACODYLE, a liquid, heavier than water, with a strong, offensive smell and a poisonous vapour. It is a compound of arsenic and the methyl group, and has the formula $As(CH_3)_2$. It was first isolated by Bunsen in 1837. Alkarsine (which see in SUPP.) is the oxide of cacodyle.

CACTUS, or CACTACEÆ, an natural order of calycifloral dicotyledonous plants, remarkable for the singular appearance they present, being, except in some species of *Pereskia*, destitute of leaves, the place of which is supplied by fleshy succulent stems. The latter are of a very grotesque shape, varying from a few inches to 60 feet in height, and are for the most part armed with spines in bundles, with which, in many species, bristles are intermixed. The habitat of the cactus order is confined almost exclusively to the New World, and more especially to Mexico, the West Indies, and South America, but the beauty of its flowers, which present the finest gradations of colours, from pure white to rich scarlet and purple, has led to some species being extensively cultivated in greenhouses, and the prickly pear or Indian fig (*Opuntia vulgaris*, *O. Tuna*, &c.), has become naturalized in the Mediterranean countries and elsewhere. The Cacti were grouped by Linnæus in a single genus, but they are now assigned to several genera, including Cereus, Opuntia, Epiphyllum, Phyllocactus, Melocactus, Echinocactus, Mammillaria, Rhipsalis, and Pereskia. The *Melocactus communis*, called also melon-thistle, or Turk's-cap cactus, is distinguished by a cylindrical cap or crown on the top of the globose stem about a foot in diameter, from which the flowers are produced. It grows on barren, rocky places in the West Indies and elsewhere. *Cereus senilis*, the old man cactus, a native of Mexico, attains a height of upwards of 20 feet, and derives its name from the mass of wiry gray hair by which the spines on its stem are surrounded. *C. giganteus*, the suwarrow, or saguaro, is the largest plant of the order, having straight columnar stems 50 or 60 feet high, sometimes with a few branches directed upwards. *C. grandiflorus*, the night-flowering cactus, a trailing species with white flowers which expand in the evening, and *C. MacDonaldi*, a native of Honduras, are about the most magnificent of the order for the size and beauty of their flowers. The columnar species of *Cereus* are sometimes known as torch thistles. Species of the genus *Opuntia* belong to a group of cacti to which the name of prickly pear has been given from the shape of their fruit and the strong, sharp spines with which it is armed. The cochineal insect cactus (*Opuntia cochinillifera*) is that on which the insect feeds that produces the celebrated scarlet dye. The genus *Echinocactus* includes species known as hedgehog thistles, mostly found in Mexico. *Echinocactus visnaga* grows to a large size, and derives its name from *visnaga*, the Spanish for *toothpick*, from the use made of its spines by the Mexicans. Species of Epiphyllum, chiefly *E. truncatum*, with flat, leaf-like branches and showy crimson flowers, are much cultivated; and the closely related genus Phyllocactus also supplies beautiful forms for cultivation. The genus Mammillaria is so named from the teat-like tubercles dotted over the stems (Lat. *mammilla*, a teat), a characteristic also referred to in the popular names mammal and nipple thistles. *Rhipsalis* comprises species growing on trees. *Pereskia aculeata* is the Barbados gooseberry (which see). Some cacti have edible fruits, and the juice of others yields an agreeable drink to travellers in the arid regions where they grow.

CADA MOSTO, or Ca da Mosto, Alois da, an early navigator, was born at Venice about 1432. In 1455 he departed from Lagos, sailed into the river Senegal, which had been discovered five years before, proceeded yet farther along the coast, and visited Prince Damel, whose states extended from the Senegal to Cape Verd. After trading in slaves and gold he steered for Cape Verd, where he joined two other discovery ships, and visited, in company with them, the mouths of the Gambia, the riches of which had been greatly extolled. In 1456 Cada Mosto, in company with two other ships, made a second voyage to the Gambia. On the way thither they discovered the Cape Verd Islands. The three ships continued their course as far as the river Casamansa and the Rio Grande, and returned to Portugal. Cada Mosto remained there till 1463. The description of his first voyage, Il Libro de la prima Navigazione per l'Oceano alle Terre de' Negri della Bassa Etiopia, di Luigi Cada Mosto (Vicenza, 1507, and Milan, 1519), the oldest of the voyages of the moderns, is a masterpiece. The arrangement is admirable, the narrative interesting, the descriptions clear and accurate. He died in 1464.

CADASTRAL SURVEY (French, *cadastre*), a territorial survey in which objects are represented in their relative positions and magnitudes. A cadastral survey differs from a topographical in not magnifying the principal objects. It requires consequently to be made on a larger scale than the topographical survey, so as to admit of a proportionally accurate representation of towns, houses, roads, rivers, &c. The scale on which the map of the United Kingdom is being prepared, $\frac{1}{2500}$ of the linear measure of the surface surveyed, is an example of the scale of a cadastral survey. This scale nearly corresponds with 25 inches to the mile. See Ordnance Survey.

CADE, John (better known as *Jack Cade*), a man of low birth, who had been obliged to flee into France for his crimes. Observing the discontents of the people on his return to England (1450), in the reign of Henry VI., he took the name of *John Mortimer*, published complaints against the abuses of government, and soon found himself at the head of 20,000 men, common people of Kent. Having defeated a force sent against him he advanced to London, which opened its gates; but the riotous disposition of his followers alarmed the citizens. They drove out and defeated the rebels, who soon dispersed, and Cade was killed by one Iden, a gentleman of Kent.

CADENCE, the concluding notes of a musical composition or of any well-defined section of it. A cadence is *perfect*, *full*, or *authentic* when the last chord is the tonic preceded by the dominant; it is *imperfect* when the chord of the tonic precedes that of the dominant; it is *plagal* when the closing tonic chord is preceded by that of the subdominant; and it is *interrupted*, *false*, or *deceptive* when the bass rises a second, instead of falling a fifth. Cadence, or cadenza, is the name also given to a running passage which a performer may introduce at the close of a movement.

CADER IDRIS, a mountain of Wales, the commencement of a chain running north-easterly. There are here several small lakes, abounding in fish. The height of the mountain is 2914 feet above the level of the sea. It is 3 miles s. of Dolgelly, Merionethshire.

CADET (French), 1. A younger brother. 2. In the French service, a cadet was a gentleman who served in the ranks without pay, for the purpose of learning the art of war. 3. It is now applied in Britain and the North American United States, to the pupils of a military academy, and to the lowest grade of officers in the navy. The cadets enter the navy about twelve or fourteen, are placed in training ships, and put under tuition in the practice of their profession. See Military Schools, Midshipman.

CADET DE VAUX, Antoine Alexis, a chemist, member of the French Collége de Pharmacie, and of many learned German societies, born in Paris, 1743, was at first an apothecary, but for many years devoted himself to agriculture. He wrote on the effect which the destruction of mountain forests has in diminishing the copiousness of the springs in the valleys, the improvement of vineyards, the cultivation of foreign plants, and the providing of substitutes for the usual articles of food in times of scarcity. He was one of the principal editors of the Journal d'Economie rurale et domestique, and of the Cours complet d'Agriculture pratique. He died in 1828.

CADET-GASSICOURT, Louis Claude, elder brother of the preceding, filled several important offices, such as apothecary to the Hotel des Invalides, inspector of French hospitals in Germany, and chemical director to the Sèvres Porcelain Works. He published a variety of researches in pure and applied chemistry, but is best known by the fuming liquor still called by his name, and which is the subject of an elaborate research by Bunsen. He was born in 1731, and died in 1799.

CADI, or Kadi, in Arabic, a judge or jurist. Among the Turks cadi signifies an inferior judge, in distinction from the molla, or superior judge. They belong to the higher priesthood, as the Turks derive their law from their prophet.

CADIZ (anciently *Gades*), a seaport, and one of the handsomest cities in Spain, is situated at the extremity of a long tongue of land projecting from the island of Leon, off the s.w. coast of Andalusia. The narrowness of the land communication prevents its capture by a military force while the garrison is master of the sea. It is walled, with trenches and bastions on the land side, the houses are high, and the streets narrow. The chief buildings are the great hospital, the custom-house, the old and new cathedrals, two theatres, the bull-ring, capable of accommodating 12,000 spectators, and the lighthouse of St. Sebastian. From the harbour the town has a fine appearance. The bay of Cadiz is a very fine one. It is a large basin inclosed by the mainland on one side, and the projecting tongue of land on the other. It is from 10 to 12 leagues in circumference, with good anchorage, and protected by the neighbouring hills. It has four forts, two of which form the defence of the grand arsenal, La Caracca, in which are three basins and twelve docks. Cadiz has long been the principal Spanish naval station. It was the centre of the Spanish American trade, and the commerce of the port was very extensive before the separation of the colonies. The preparation of salt from pits belonging to the government was formerly an important branch of industry, but is now of comparatively little consequence. The manufactures of Cadiz are of comparatively little importance, but in regard to the extent and value of its commerce it ranks as one of the first ports in Spain. Its imports consists of all kinds of foreign and colonial produce, coal, cotton, and woollen manufactures, &c.; its exports of wines, fruits, oils, and other products of Spain. The town of Santa Maria, opposite Cadiz, is the principal depôt of the wines of Xeres. Notwithstanding the political agitations of recent years, the commerce of Cadiz has continued prosperous. The number of ships which annually enter is about 2600, with a tonnage of nearly 1,600,000, large part of which is foreign. Cadiz was founded by the Phœnicians about 1100 B.C., and subsequently belonged in succession to the Carthaginians and the Romans. It was taken by the Earl of Essex in 1596, and from its bay Villeneuve sailed previous to the battle of Trafalgar in 1805. In 1809 it became the seat of the central junta, and afterwards of the cortes. It sustained a long blockade from the French (1810–12), which was not raised till after the battle of Salamanca. In 1823 the French entered it after a short siege. An insurrection occurred in Cadiz in 1868, and the town was declared in a state of siege in Dec., but the siege was raised in the following January. The construction of railways and the rising prosperity of Spain have increased the commerce of Cadiz. Pop. in 1897, 70,177.

CADMIUM, a scarce metal found in some of the ores of zinc, and discovered by Stromeyer in 1817. It resembles tin in colour and lustre, but is a little harder. It is very ductile and malleable; has a specific gravity of 8·6 to 8·69; and fuses a little below a red heat. In its chemical character it resembles zinc. It nowhere occurs native; and the only ore of cadmium is the sulphide of cadmium or Greenockite, found in Renfrewshire, and some other places, which, when prepared artificially, is the pigment called cadmium yellow. The iodide of cadmium, owing to its stability, its solubility in alcohol and ether, and other properties, is used in photography.

CADMUS, in Greek mythology the son of Agenor and grandson of Poseidon. With his brothers he was sent by his father to seek for his sister Europa, who had been carried away by Zeus, and he was not to return without her. After several adventures Cadmus inquired of the oracle at Delphi, which commanded him to desist from further search, to intrust himself to the guidance of a heifer, and where she should stop to built a city. He accordingly went to Bœotia, where he wished to sacrifice the cow to Athena. But his companions, in attempting to fetch water from the fountain of Ares for the purpose of the sacrifice, were slain by the dragon that guarded it. Cadmus killed the dragon, and, at the command of Athena, sowed its teeth in the earth; armed men immediately sprang up, whom he called Sparti (the sowed), but who perished in a contest with each other, excepting only five. With the remainder he built the city of Cadmea or Thebes (see THEBES). Zeus then married him to Harmonia, and all the gods were present at his nuptials. He became by this marriage the father of Antinoe, Ino, Semele, Agave, and Polydorus. After ruling for a time the city which he had built, and the state which he had founded, he proceeded, at the command of Bacchus, with Harmonia to the Enchelæ, conquered their enemies, the Illyrians, became their king, and begat another son, Illyrius. Zeus finally changed him and Harmonia into serpents, or, as some say, into lions, and transported them to Elysium. Tradition states that Cadmus came to Bœotia from Phenicia, 1550 B.C., conquered the inhabitants who opposed him, and, in conjunction with them, founded the above-mentioned city. To promote the improvement of his new subjects he taught them the Phenician alphabet, the employment of music at the festivals of the gods, besides the use of copper, &c.—Another Cadmus, of Miletus, a son of Pandion, was regarded among the Greeks as the first who wrote in prose. He lived about 600 years before Christ.

CADORE, or PIEVE DI CADORE, a town, Kingdom of Italy, in the province and 22 miles N.N.E. of the town of Belluno, on the Piave, derives its chief interest from being the native place of Titian, who was born here in 1477.

CADUCEUS, a wand of laurel or olive, with two little wings on the upper end, about which two serpents are twisted. Their heads turned towards each other, and their crests not bristled, served for a symbol of peace. It was borne by the ancient heralds, whose persons were then sacred and inviolable. The fable tells us that Apollo gave this staff to Mercury in consideration of his resigning to him the honour of inventing the lyre. As Mercury entered Arcadia with this wand in his hand he saw two serpents fighting together; he threw the staff between them, and they immediately wound themselves around it in friendly union. The serpents which adorn this staff were, according to Böttiger, originally emblems of the knots with which the oldest merchants of the Mediterranean Sea secured their chests and goods. The Caduceus is Mercury's peculiar mark of distinction. With this he conducted the shades to the lower world, and from it received the name of Caducifer; yet we find it on ancient coins in the hands of Bacchus, Hercules, Ceres, Venus, and Anubis. Among the moderns it serves principally as an emblem of commerce.

CÆDMON. See ANGLO-SAXONS—Literature.

CÆLIUS MONS, one of the seven hills on which Rome was built. It is said to have received its name from Cælius Vibenna, an Etruscan, to whom it was assigned. The palace of Tullus Hostilius was on this mount. It is at present covered with ruins, which serve to excite the curiosity and baffle the ingenuity of antiquaries.

CAEN, a town of Northern France, the capital of the dep. Calvados, and the ancient capital of Normandy, 125 miles N.W. of Paris, and about 9 miles from the mouth of the Orne, which is here navigable and crossed by several bridges. There is a dock connected with the sea by both river and canal. Caen is the centre of an important domestic trade, the market of a rich agricultural district, and carries on extensive manufactures. The streets are broad, regular, and clean, the houses well-built of white freestone, and it possesses various ancient and remarkable edifices. The public promenades and recreation grounds are beautiful, and there are various extensive squares and 'places'. The church of La Trinité, a fine edifice in the Norman-Romanesque style, restored in modern times, was formerly the church of the Abbaye-aux-dames, founded in 1066 by Matilda, wife of William the Conqueror. The church of St. Stephen was founded at the same time by William the Conqueror, as the church of the Abbaye-aux-hommes, and though considerably modified since is a noble and impressive edifice. It has two fine western towers 295 feet high. The Abbaye-aux-hommes, built by the Conqueror, who was buried in it, is now used as a college, having been rebuilt in the eighteenth century. One of the finest churches in Caen is that of St. Pierre, whose tower (255 feet), terminated by a spire, is exceedingly elegant. Among other public buildings are the Hôtel de Ville, the prefecture, and the palace of justice. Caen possesses a university faculty or college, a public library with some 100,000 volumes, a gallery of paintings with valuable works of old masters, a natural history museum, an antiquarian museum, &c. The hospital of the Abbaye-aux-dames is one of the best regulated in France. The hospital of the Bon-Sauveur is another admirable institution. The city was formerly fortified, and there are remains of a castle begun by William the Conqueror and finished by Henry I., but since much altered and now used as barracks. Caen first rose into importance in the time of William the Conqueror. In 1346 it was taken by Edward III., at which time it was said to be larger than any city in England except London. Henry VI. of England founded a university here in 1431, Caen having been in the possession of the English from 1417 to 1450. It suffered much in the religious wars between the

Protestants and Catholics of France. Admiral de Coligni captured it for the Protestants in 1562. Caen carries on ship-building, and its manufactures embrace linen, woollen, and cotton goods, lace, ropes, metal goods, and various other articles. It carries on a considerable trade in timber and other articles, including agricultural produce exported to England, to which also is still exported the Caen building stone famous for many centuries. Malherbe, Laplace, Elie de Beaumont, and Auber were born in this city or in its vicinity, and are commemorated by statues. Pop. in 1896, 37,457.

CAERLEON, a small town in Monmouthshire, 3 miles above Newport, on the Usk, in which the tide rises 30 feet. (See BRISTOL CHANNEL.) It was the site of the *Isca Silurum*, the chief Roman station in the country of the Silures; and Roman coins, statues, and sepulchral monuments are yet found. There are also the vestiges of an amphitheatre, which the inhabitants call *King Arthur's Round Table*, from a tradition that he instituted the round table in this place. Caerleon was at one time the metropolis of Wales. Pop. 1411.

CAERMARTHENSHIRE. See CARMARTHENSHIRE.

CAERNARVON. See CARNARVON.

CAERNARVONSHIRE. See CARNARVONSHIRE.

CÆSALPINIEÆ, a subdivision of the natural order of plants Leguminosæ, containing several genera. The botanical characteristics of the sub-order are: calyx in five divisions, joined together at different points, or often cleft to the base, with prefloration imbricated or valvular; petals equal or fewer in number; stamens often not symmetrical to the other parts of the flower, or very irregular, sometimes very numerous, sometimes partly abortive, rarely regular; very often free, or lightly joined together at the base only; ovaries raised on a free support, or joined in part to the calyx, and becoming legumes, which sometimes contain only one single or double ovule, and of which the pericarp may have a fleshy consistence; seeds without perisperm; embryo often straight; stalk arborescent or fruticose, sometimes creeping; leaves simple, or more frequently compound; in the latter case frequently bipinnate. The typical genus is Cæsalpinia, to which belong the Brazil-wood, sapan-wood, Nicaragua-wood, &c. The Cæsalpinieæ include also among their number senna, the carob, tamarind, aloes-wood, logwood, &c. (See these articles.)

CÆSAR was the name of a patrician family of the Julian gens, which traced its origin to Julus, the son of Æneas. The first member of the family who occurs in history with the surname of Cæsar was Sextus Julius Cæsar, prætor, B.C. 208. Cæsar was the family name of the first five Roman emperors. With Nero the imperial family became extinct (A.D. 68), and Cæsar became merely a title of dignity. The emperor, who bore the title of Augustus, appointed his successor, with the title of Cæsar. On medals and monuments we find the title Cæsar preceding the name of the emperor, as 'Imp. Cæsar Nerva Trajanus Augustus,' and following that of the designated successor, as 'Marc. Aurel. Antonin. Cæsar.' In the lower Greek Empire, a new dignity of Sebastocrator was conferred, and that of Cæsar became the third rank in the state.

CÆSAR, CAIUS JULIUS, a great Roman general, statesman, and historian, was born July 10 (*Quinctilis*), B.C. 100. He was the son of the prætor Caius Julius Cæsar, and of Aurelia, a daughter of Aurelius Cotta. From his earliest boyhood he discovered extraordinary talents. He had a penetrating intellect, a remarkably strong memory, and a lively imagination; was indefatigable in business, and able, as we are told by Pliny, to read, write, hear, and dictate at the same time, from four to seven different letters. When the party of Marius, who was the uncle of Cæsar by marriage with his aunt Julia, gained the ascendency in Rome, Cinna, the friend of Marius, gave his daughter Cornelia in marriage to Cæsar, with the view thereby to establish his own power more firmly. Cæsar, who was already married, divorced his wife Cossutia to marry Cornelia, which provoked the anger of Sulla, who ordered him to put away Cornelia. Pompey and M. Piso were also ordered to put away their wives, and obeyed, but Cæsar resisted and was proscribed, and obliged to take refuge in the Sabine territory, being deprived of his wife, his fortune, and the priesthood which he had held from the age of thirteen. His friends obtained his pardon with difficulty, the dictator observing that 'in that boy there were many Mariuses.' Cæsar now withdrew from Rome, and went to Asia, serving his first campaign under M. Minucius Thermus, the prætor in Asia, who intrusted him with the command of the fleet which was to blockade Mitylene. In the execution of this trust Cæsar distinguished himself highly, although but twenty-two years old. On the death of Sulla Cæsar returned to Rome, distinguished himself as an orator in his accusations against Dolabella and other causes which he prosecuted, and used every means to increase his popularity. He afterwards visited Rhodes, and placed himself under the instruction of Apollonius, to fit himself for speaking at the bar. On the way he was taken by pirates, and compelled to pay fifty talents for his release. To revenge himself, he fitted out some vessels at Miletus, overtook the pirates, made the greater number of them prisoners, and had them crucified before Pergamus. He now returned to Rome, entered into alliance with Pompey, and became military tribune, quæstor, and ædile. At the same time he had the address to win the favour of the people by affability, by splendid entertainments, and public shows; and, trusting to his popularity, he ventured to erect again the statues and trophies of Marius, who was hated by the senate and the patricians. He was accused of taking part in the conspiracies of Catiline, but no substantial proof has been given in support of the accusation, which was unlikely, as Cæsar had easier means of acquiring power. He defended the conspirators, who were arrested, and Cato strongly opposed him, so that he was obliged to quit the rostrum, and even his life was endangered. In the year B.C. 62 Cæsar was prætor. He had already, B.C. 63, been chosen pontifex maximus. On the expiry of his prætorship he obtained the government of Further Spain. His profuse expenditure in courting popularity had involved him deeply in debt. His creditors refusing to let him depart, Crassus became his security for the enormous sum of 830 talents. It was on his journey to Spain that he expressed, on seeing a miserable village, the well-known sentiment, that 'he would rather be first there than second at Rome.' In Spain he made several conquests, and returned to Rome with money enough to pay off his debts.

He now endeavoured to reconcile Pompey and Crassus, whose enmity by throwing the influence of the latter into the aristocratic party would have interfered with the ambitions designs which Cæsar and Pompey had formed. He succeeded in his design, and all three agreed to divide the sovereign power between them. This was the first triumvirate in Roman history (B.C. 60). Cæsar then became consul with M. Calpurnius Bibulus, confirmed the measures of Pompey, and procured the passing of a law in opposition to the senate and his colleague to distribute certain lands among the poor citizens. This brought him into the highest favour with the people. With Pompey he formed a still more intimate connection by giving him his daughter Julia in marriage, and gained the favour of the equestrian order by remitting a third part of their taxes. When the year of his consulship had expired, Cæsar obtained the government of Gaul for five years, with the command of four legions. After his marriage with the accomplished Calpurnia, the daughter of one of the new consuls, Calpurnius Piso, he repaired to Gaul (B.C. 58), compelled the Helvetii, who had invaded that province, to retreat to their native country, subdued Ariovistus, who at the head of a German tribe had attempted to settle in the country of the Ædui, and conquered the Belgæ. In nine years he reduced all Gaul, crossed the Rhine twice (B.C. 55 and 53), and twice passed over to Britain (B.C. 55 and 54), defeated the gallant natives of this island in several battles, and compelled them to give him hostages. A rising of the Gauls under Vercingetorix was not put down without difficulty, but the country was latterly reduced to quietness, and was ruled by the conqueror with policy and kindness. The senate had continued his government in Gaul for another period of five years, while Pompey was to have the command of Spain, and Crassus that of Syria, Egypt, and Macedonia for five years also. But the death of Crassus in his campaign against the Parthians dissolved the triumvirate; and the death of Julia, which took place about the same time, cooled the friendship between Cæsar and Pompey—each intent upon his own aggrandisement.

Meanwhile the power and authority of Pompey had been constantly increasing. Cæsar, too, strove to strengthen and enlarge his own party in the capital. Pompey now lent his influence to the aristocratic party, and persuaded the senate to pass a decree, by which Cæsar was to leave his army and resign his government of Gaul. He declared himself ready to obey if Pompey would do the same. Hereupon the senate ordered that Cæsar should resign his offices and command within a certain time, or be proclaimed an enemy to the state, and appointed Pompey general of the army of the Republic. Upon this Cæsar urged his soldiers to defend the honour of their leader, led his faithful veterans across the Rubicon, a small stream then regarded as separating Italy from Gaul (49 B.C.), and made himself master of the peninsula without striking a blow. Pompey, destitute of troops to meet him, had left the city with the consuls, senators, and magistrates. Cæsar then levied an army with the treasures of the state, and hastened into Spain, which he reduced to submission without coming to a pitched battle with Pompey's generals. After conquering Massilia (now Marseilles), he returned to Rome, where he had already been appointed dictator. He was also chosen consul for the following year by the people.

Pompey, who had retired from Italy, had now collected a considerable army, and his rival hastened to Epirus with seven legions to meet him. But the vessels which were intended to transport the rest of his troops were captured by Pompey's fleet, and Cæsar was for a time in a somewhat critical position. He soon, however, received the expected reinforcements, and advanced against his antagonist. Pompey declined coming to an engagement, but at last, being surrounded in his camp, was forced to take a decisive step in order to break through the enemy's line. This measure was successful, and Cæsar retreated to Pharsalia, where, in a bloody but decisive engagement (48 B.C.), he gained the victory over forces much superior in numbers. Pompey fled to Asia, and then to Egypt, to raise a new army. As his party was only weakened, but not destroyed, Cæsar hastened after him, passed over the Hellespont, where Cassius surrendered to him with his fleet, and then went to Egypt. Here he received intelligence of the murder of Pompey. He shed tears at the tragical end of his rival, gave his body an honourable burial, and loaded his followers with favours, by which many of them were won to embrace his cause. In Egypt he became involved in a war owing to his interference in a dispute regarding the respective claims of Cleopatra and her brother Ptolemy. Cleopatra became by him the mother of a son. Pharnaces, king of Pontus, a son of Mithridates the Great, having attempted to recover the territories of his father in Asia, Cæsar marched against him, pardoned King Deiotarus, an adherent of Pompey, on his way, and finished the war so speedily, that he announced his success to his friends in the famous words, *Veni, vidi, vici.*

Returning to Rome he granted an amnesty to all the followers of Pompey, and gained by his clemency the universal love of the people. When his dictatorship had expired he caused himself to be chosen dictator and consul again, and without changing the ancient forms of government, ruled with almost unlimited power. In Africa, however, the Pompeian party had gathered under the standard of Cato and other generals. Cæsar passed over with an army, and fought several battles with various success, till the victory at Thapsus (B.C. 46) decided the contest in his favour. Cato, who was in Utica, and saw no hope of making head against the victor, stabbed himself, and the city surrendered. Cæsar then made Mauritania and Numidia Roman provinces, and gave orders for the rebuilding of Carthage and Corinth. This was accomplished in a year. In Rome he was received with the most striking marks of respect. The term of his dictatorship was prolonged to ten years, the office of *præfectus morum* (supervisor of morals) conferred on him, and a public thanksgiving of forty days was decreed in his honour. In a speech to the people he declared his resolution to use his power for the good of the state; and put an end to the apprehensions which some still entertained, by the pardon of his most open and bitter enemies. He now celebrated the four triumphs which had been decreed him over Gaul, Egypt, Pontus, and Africa, and which were among the most magnificent ever witnessed in Rome. Gifts of corn and money were lavishly bestowed upon the people and the soldiers, and shows and entertainments of all kinds were provided for the public. Measures were passed for the removal of evils and for various beneficial ends, and among other things Cæsar carried out the reformation of the calendar. During these peaceful occupations the sons of Pompey had collected new forces in Spain, so that Cæsar took the field in person against them. Parties came to a general engagement at Munda. A fortunate accident decided the battle in favour of Cæsar, after victory had been for a whole day doubtful. In seven months Spain was conquered, and Cæsar entered Rome in triumph. He was now made perpetual dictator, received for life the title of *imperator*, with full powers of sovereignty, and was also declared *præfectus morum* for life. He received the honorary title of 'Father of his country', statues of him were placed in the temples, and divine honours were decreed him; and as a further honour the month hitherto called Quintilis was henceforth to be known as Julius (July).

He still continued to conciliate his enemies by clemency, and to heap honours upon his friends. The number of senators he increased from 300 to 900, and many of his supporters thus found admission. By increasing the numbers of the public magistrates others of them were in like manner rewarded. But enemies were at work forming plots against his life—some from mistaken notions of patriotism, others inspired rather by malice and envy. Cæsar's desire for the title of king gave some foundation for feelings of the former class. On one occasion, at a public festival, Mark Antony offered him a royal diadem. He refused it, however, and his refusal drew shouts of applause from the people. Cæsar, having no suspicion of the danger which threatened him, was forming new projects. He resolved to subdue the Parthians, and his friends gave out that according to the Sibylline books the Parthians could be conquered only by a king, and therefore proposed that Cæsar should retain the title of *dictator* with regard to Italy, but should be saluted with that of *king* in all the conquered countries. For this purpose a meeting of the senate was appointed for the 15th (the *ides*) of March, and this was the day fixed on by the conspirators for the execution of the plot. Foremost among them were Brutus and Cassius, both of whom had received favours from Cæsar. It had been arranged that Tillius Cimber should entreat a pardon for his brother, and when doing so was to tear the mantle from Cæsar's shoulders as the signal for their rushing upon him with their daggers. All was done as they had planned. Casca's dagger first pierced him in the neck. Scarcely had Cæsar turned, and uttered the words, 'Accursed Casca, what doest thou?' when the conspirators rushed upon him from all sides. He defended himself, however, for a little. But when he descried Brutus among the conspirators, he exclaimed, 'And thou, too, Brutus?' covered his face with his mantle, and fell, pierced with twenty-three wounds, at the foot of Pompey's statue. Thus died 'the foremost man of all this world', B.C. 44, on the 15th of March, in the fifty-sixth year of his age. He was great as a statesman, a general, an orator, a historian, and an architect and engineer, and his assassination was brought about more by jealousy and envy than by real patriotism. Of his writings, we still possess the history of his wars with the Gauls in the commentaries De Bello Gallico, and with Pompey in the De Bello Civili, written in a simple, noble style. They have been frequently edited and annotated, and there are also numerous translations in various languages.

CÆSAREA, the ancient name of many cities.—1. Cæsarea Philippi, or Paneas, named after Philip, tetrarch of Galilee, son of Herod the Great, who founded it in B.C. 3-2, near the source of the Jordan. It is mentioned twice in the Gospels. On its site is the small modern village of Banias.——2. Cæsarea Palestinæ or Stratonis, on the shores of the Mediterranean, about 55 miles N.W. from Jerusalem. It was built with great magnificence by Herod the Great, and became the metropolis of Palestine, and the seat of the Roman proconsul, as well as a busy seaport. It was the place where Herod Agrippa was smitten by the angel (Acts xii. 20–23), where Cornelius the centurion resided (x.), and St. Paul was imprisoned two years (xxiii.–xxv.). It was a place of some importance during the Crusades, but is now a scene of ruin and of utter desolation. Eusebius was bishop of Cæsarea.——3. The ancient capital of Cappadocia in Asia Minor, originally called *Mazaca*, and now *Kaisarich*. It is situated in the south-east of the vilayet of Angora, at the foot of the Erjish Dagh, about 160 miles to the south-east of the town of Angora. It was once supposed to contain 400,000 inhabitants. It has now about 70,000 inhabitants, and its position makes it a place of considerable trade. The manufacture of carpets, though of quite recent introduction, is of some importance. European goods are received by way of the railway from Angora to Constantinople. The name Cæsarea dates from the time of Tiberius, and under Valerian the city was captured by Sapor, when a large number of its inhabitants were slain.

CÆSAREAN OPERATION, a surgical operation, which consists in delivering a child by means of an incision made through the walls of the abdomen and womb. There are three cases in which this may be necessary: first, when the child is alive and the mother dead, either in labour or in the last two months of pregnancy; second, when the child is dead, but cannot be delivered in the usual way on account of the deformity of the mother or the disproportionate size of the child; and third, when both mother and child are living, but delivery cannot take place from the same causes as in the second case. In many instances both mother and child have survived this critical operation; and cases are known in which it has been successfully performed by the mother herself. The etymology of the name is doubtful, but probably it is derived from Julius Cæsar, who Pliny tells us was brought into the world in this manner. The operation would therefore appear to have been known from ancient times.

CÆSIUM, a metallic element discovered in 1860 by Bunsen and Kirchhoff, in the course of their spectroscopic examination of the residue of evaporated Dürkheim water. Since then it has been found in many mineral waters, in the ash of tobacco, beetroot, and other plants, and in various minerals; it is therefore widely distributed, but it occurs nowhere in large quantity, except in the rare mineral pollux (which see). Its symbol is Cs, its atomic weight 132·7, its specific gravity 1·88, and its melting point about 79° F. In every respect it closely resembles potassium and rubidium (which see), so closely indeed that it is only by minute differences of properties that these bodies can be distinguished and isolated. Cæsium can be prepared from its chloride by a galvanic current, or by distilling the carbonate with charcoal, as in the case of potassium. Its most marked characteristic, that by which it was first discovered, is the position of two bright blue lines in its spectrum, associated with certain green and yellow lines. It is the most electro-positive element.

CÆSTUS, the boxing-glove of the Grecian and Roman pugilists. It consisted of thongs or bands of raw hide or leather, fastened to the hand, and reaching to the wrist. It was afterwards enlarged so as to reach up to the elbow, and loaded with metal to increase the weight of the blow. The combat with the ordinary unloaded cæstus was not more dangerous than a common English boxing-match. Theocritus (Idyll. xxii.) has described one of these combats.

CÆSURA (Lat., literally a cutting), in verse. the separation of the last syllable of any word from those which precede it, and the carrying it forward into another foot. The term originally belongs to classical verse, in which the cæsura renders the syllable on which it falls long (if not otherwise so), and is accompanied by a slight pause, hence called the *cæsural pause*, as in the following line:—

Ille la*tus* nive*um* mol*li* ful*tus* hyacintho.

See Rhythm, Verse.

CAFFA (or Kaffa), Strait of. See Yenikalé.

CAFFEINE or Theine, an alkaloid existing to the extent of from 0·8 to 3·6 per cent in coffee and from about 2 to 4 per cent in tea, first prepared by Runge in 1820. The identity of the substances obtained from coffee and tea was demonstrated by Mulder and Jobst. Subsequently it was obtained by Dr. Stenhouse from Paraguay tea, and by other chemists from other vegetables. Pure caffeine has the composition

$C_8H_{10}N_4O_2$, being very closely allied to theobromine, the alkaloid found in cocoa, and forms white silky needles, or short transparent prisms, which are gritty and bitter in the mouth, dissolve sparingly in water, and still more sparingly in alcohol and ether. When heated they lose water of crystallization, fuse and sublime. Caffeine is what chiefly gives their stimulating properties to coffee and tea. In large doses it produces convulsions in animals, and often causes death. Caffeine combines with acids, and forms beautiful double salts with gold, platinum, and other metals. The citrate is a powerful drug used in certain cases of headache, dropsy, &c.

CAFFRARIA, or KAFFRARIA, a name adopted by the Portuguese from the Arabs, who call all the African continent, southward from Sofala, the *land of kafirs* (infidels). It was first applied to the whole width of the continent, from Cape Corrientes on the E. to Cape Negro on the W. As the names of particular states and peoples became known, the extent of Caffraria diminished; the term, latterly applied only to the territory between the north-eastern borders of Cape Colony and Natal, is now going out of use, its substitute being the Transkeian Territories, which form part of Cape Colony. The district for some time called British Caffraria was formerly part of the territory of the Amaxosa and Amatemba Caffres, by whom it was ceded to Sir B. Durban in 1835. It was restored to the Caffres in the following year, but again taken possession of by the British in 1847. In 1860 it was erected into a separate colony, and in 1865 was incorporated with Cape Colony, and the name has fallen out of use. The chief town here is King William's Town.

CAFFRES, or KAFFIRS, a native race of Southern Africa, belonging to the great Bantu family, of negroid character, but distinguished from the Negroes by a larger facial angle (the head being formed like that of Europeans), a high nose, hair frizzled, but less woolly than that of the Negroes, and a brown or iron-gray complexion, differing from the shining black of that race. The origin of the name is given in the preceding article. It is now retained by geographical writers to denote the savage tribes, whose physical characteristics have been described, extending on the E. side of Africa from the Cape Colony to Delagoa Bay or farther north. They are divided into branches which take their name from the founder of the branch, generally with Ama, signifying people, as a prefix. In 1780, at the time when the Great Fish River was made the boundary between the Cape Colony (then Dutch) and the Caffres, there were four great branches occupying this region—the Amapondomisi, the Amaponda or Pondos, the Amatemba or Tambookis, and the Amakosa or Amaxosa. The last-mentioned branch was subdivided into two smaller ones, the Amagaleka, inhabiting the region north-east of the Great Kei river, and the Amararabe, the region south-west of that river. The Amafengu or Fingoes are a tribe of more recent formation, consisting of the remnants of once powerful tribes that were dispersed and driven southward by Tshaka, a powerful king of the Zulus or Amazulu, another Caffre tribe dwelling north of Natal. The former tribes have been incorporated with Cape Colony, and Zululand has been latterly annexed to Natal. The Zulus, or Amazulu, originally a small tribe settled on the N. of the Tugela River, first acquired political importance in the course of the nineteenth century, and extended their sway as far N. as the Delagoa Bay, and also far into the interior. A large number of them now dwell within the boundaries of Natal, where they are becoming civilized. The Swazi or Amaswazi dwell between the Transvaal and Delagoa Bay. The Matabele, now living north of the Limpopo, who have been rather prominent in recent years, are also a branch of the Caffres. They at one time lived much further south, but were driven north by the Boers. The Caffres are a tall, handsome, vigorous race, of simple habits, their principal food being milk in the form of curd. They are all passionately fond of tobacco. Their dress used to be entirely made of skins, but latterly they have begun to substitute various European articles, such as blankets. Ivory rings, beads, feathers, &c., are their chief ornaments. Their dwellings are low, circular cabins, grouped in *kraals*, or villages, and are constructed by the women. Plurality of wives is general. Cattle are of the first importance and the chief object of affection to a Caffre. They obey and follow their master like dogs. The ground is cultivated by the women. At the age of twelve the boys are appointed to the care of cattle, and exercised publicly in the use of the javelin and the club. The girls, under the inspection of the chiefs' wives, are taught to perform the work of the hut and the garden. The Caffres display great skill in the use of arms. Their weapons are the *assagai* or spear, the shield, and the club. They are very fond of the chase. Each horde or tribe has a hereditary and absolute chief. Their religion is a sort of ancestor-worship, and amongst them the practice of witchcraft is prevalent. Various Christian missions have met with considerable success amongst them. The continued encroachments of the British, and other accompanying circumstances tending to arouse the suspicions and exasperate the feelings of the natives, have repeatedly led them to engage in open hostilities, and they have proved formidable opponents to the Dutch and British. What are known as the first, second, and third Caffre wars took place respectively in 1811, 1819, and 1835, the Caffres on each occasion swarming in great numbers across the Fish River into Cape Colony. From 1846 to 1853 there were almost constant hostilities. Peace was, however, maintained with all the tribes from 1853 to 1879, when a war with the Zulus north of Natal broke out, in which the British, though ultimately successful, sustained a severe disaster. See BOERS, CAPE COLONY, NATAL, ZULULAND.

CAFTAN, the well-known national garment of the Turks, in the form of a loose gown, generally white, with pale-yellow flowers. It is made of woollen or silk stuff, and sometimes lined with costly fur.

CAGLIARI, the capital of the island of Sardinia, is situated on a hill slope near the south coast. It consists of four parts—1, the Castle or old town; 2, the Marina; 3, Estempache; 4, the Villa Nuova or new town. It is fortified, and is the residence of the viceroy and of an archbishop, and the seat of a university founded in 1596, and revived and remodelled in 1765. Cagliari has some manufactures, and is the chief emporium of the Sardinian trade. There are dockyards and a spacious and safe harbour. The 'Castle' contains some important buildings, including palaces of the nobility. The cathedral, partly faced with marble, was completed in 1312, but afterwards modernized. There are some interesting remains of Roman times, including an amphitheatre and ancient dwelling-houses. Cagliari was the residence of the kings of Sardinia from 1798 to 1814. It is connected by railway with the most important Sardinian towns. Pop. (1896), 44,600.

CAGLIARI, PAUL, also known under the name of *Paul Veronese*, a painter of Verona, born about 1528–32 His father, who was a sculptor, wished to educate his son for the same profession. but the young man betrayed a greater inclination for painting, and was therefore placed under his uncle, Antonio Badile. He next went to Mantua and Vicenza, and afterwards to Venice. Here he imitated Titian and Tintoretto, but at the same time appeared desirous of surpassing them by a more studied elegance, and a richer variety of ornament. It soon became evident from his works that he had studied the casts of ancient statues, and the etchings of Parmesan and Albert Dürer. In his first great works, which are in the Church of St. Sebastian in Venice, his pencil appears timid. The History of Esther, in fresco, which he afterwards painted in this church, excited general admiration; and the execution of important works was intrusted to him, among which are many that adorn the library of St. Mark's. He afterwards accompanied the Venetian ambassador Grimani to Rome, where he saw with enthusiasm the beautiful models of Raphael and Michael Angelo, and painted after his return his fine Apotheosis of Venice. His numerous banqueting pieces are also excellent. Six at least of these are found at Venice in the refectories of the monasteries, among the best of which are the Marriage at Cana, comprising 120 figures, many of which are portraits, and the Feast of Christ with Simon. In the former piece the extravagant display of Asiatic pomp, and the confusion of different persons and dresses, have been justly censured. In the latter the air of pride in the aspect of Christ, instead of a simple expression of dignity, the placing of the principal personage in a corner of the picture, and the confused blending of the white table-cloth and the architecture of the back-ground, have been considered blemishes. In his Pilgrims of Emmaus Paul violated all the unities of time, place, and action. But with all these faults he displays splendid talents and great fruitfulness of conception. His portraits are spirited and noble, and his colouring splendid. He died in 1588. His scholars were Charles and Gabriel, his sons, and Benedetto, his brother, besides Michael Parrasio, Naudi, Maffei, Verona, Francesco Montemezzano.

CAGLIOSTRO, Count of (real name *Giuseppe Balsamo*), a celebrated charlatan, was born in 1743 at Palermo. His father died when he was young, and he was educated by his maternal relations. He entered the order of the Brothers of Mercy, where he found an opportunity to cultivate his talents for medical science, by which he afterwards distinguished himself. But he showed at the same time a great love of dissipation, and was at last compelled to separate from the order. He returned to Palermo, where, among other tricks, he deceived some credulous persons by his pretended skill in magic and the finding of hidden treasures. He also showed himself adroit in counterfeiting handwriting, and attempted to get possession of a contested estate by means of a forged document, but was discovered and obliged to flee. He now determined to go to Rome, and in his journey through Calabria became acquainted with the beautiful Lorenza Feliciani, daughter of a belt-maker. She appeared to him intended by fortune to assist his designs. He formed an intimacy with her, and soon compelled her to assist in the accomplishment of his purposes by the loss of her virtue. They now began their travels, in which he assumed the character of a man of rank, first appearing under the name of the *Marquis Pellegrini*, and finally under that of the *Count Cagliostro*. He travelled through many countries of Europe, stopped in the capital cities, and by his chemical mixtures, by his tricks, and by the amours of his lady, gained considerable sums. We find him in Madrid, Lisbon, Paris, London, and many other cities. He knew how to cheat with great ingenuity, and was always fortunate enough to preserve himself by an early flight if men's eyes began to be opened, or waking justice threatened him with imprisonment. The discovery of the philosopher's stone, the preparation of a precious elixir vitæ, &c., were the pretences by means of which he extracted considerable sums from credulous people. Many had recourse to his assistance, not indeed to be initiated into the mysteries of magic, but to purchase at a high rate different kinds of medicine, one of which was the *water of beauty*. This profitable business employed him many years; but with the fading charms of his lady many sources of wealth failed. His trade in medicine also began to grow less lucrative, and he determined to seek his fortune as the founder of a new and secret sect. In pursuance of this plan he passed himself off during his second residence in London for a freemason, and played the part of a magician and worker of miracles, in which character he drew upon himself the eyes of all the enthusiasts in Europe. The Countess Cagliostro, on her part, did not remain idle. She was the first and most perfect scholar of her husband, and played the part of a priestess to this new order in as able a manner as she had before played that of a priestess to another goddess. His plan for reviving an old Egyptian order, the founders of which he declared to be Enoch and Elias, contained a mass of the greatest absurdities and nonsense. But his pretensions to supernatural power, the mystery with which his doctrines were enveloped, his pretended ability to work miracles, his healing the sick without pay, with the greatest appearance of generosity, and the belief that, as the *Great Kophta* (this name he had taken as the restorer of Egyptian masonry), he could reveal the secrets of futurity, gained him many friends and supporters. Cagliostro again travelled through Europe, and attracted great attention in Mittau, Strasburg, Lyons, and Paris. While in this last city (1785) he had the misfortune to be implicated in the scandalous affair of the necklace, and was banished the country as a confidant of Cardinal Rohan. He now returned to London, and sent many epistles to his followers, wherein he bitterly complained of the injury he had received in France, and painted the French court in the blackest colours. From London, where he could not long remain, he went to Basel and other cities in that quarter. But at length, listening to the repeated entreaties of his wife and other friends, he returned (1789) to Rome. Here he busied himself about freemasonry; but being discovered, and committed to the Castle of St. Angelo, he was condemned by a decree of the pope to imprisonment for life as a freemason, an arch heretic, and a very dangerous foe to religion. He died in the summer of 1795 in the Castle of St. Leo, a small city in the States of the Church. See Carlyle's article on Cagliostro in his Miscellaneous Essays.

CAGNOLI, Antonio, astronomer, member of the French National Institute, and president of the Italian Academy of Sciences, was born at Zante in 1743, and was attached in his youth to the Venetian embassy at Paris, where, after the year 1776, he showed more love for astronomy than for diplomacy. Having settled in Verona in 1786 he constructed an observatory in his own house, by his observations in which he enriched the science of astronomy with many discoveries. After the destruction of his observatory by the French (1798), who, however, compensated him for his loss, his instruments were transferred to the observatory of Brera in Milan, and he was appointed professor of astronomy in the military school at Modena. In 1814 he went back to Verona, and died there in 1816. His best works are Notizie Astronomiche adat. all' Uso comune (Modena, 1802, two vols., with plates); and his Trigonometria Piana e Sferica (second edition, Bologna, 1804, with plates), translated into French by Chompré (second edition, Paris, 1804, 4to)

CAGOTS, an unfortunate race or caste of men, living in the S. of France in the region of the Pyrenees, regarded as a sort of pariahs or social outcasts. In former ages they were shut out from society as lepers, cursed as heretics, abhorred as cannibals and pederasts; their feet were bored with an iron, and they were forced to wear a piece of red cloth in the shape of a duck's foot on their clothes by way of distinction. The only trade they were allowed to follow was that of sawyers or carpenters. Priests refused to hear them confess, they had to enter the church by a special door, and had a special corner set apart for them with a holy-water vessel for themselves. Opinions are much divided with regard to the origin of the Cagots, of whom there are now comparatively few. They have been considered by some to be remains of the Saracens conquered by Charles Martel. The most plausible conjecture is that which derives them from the Visigoths who established themselves in the S. of France and in Spain in the fifth century. The origin of the name has been the subject of equal controversy. Among numerous derivations, is that from *canis* and *gothus*, 'dogs of Goths.' Others derive the name from a word simply meaning leper, and believe that the Cagots were originally lepers, who as such were expelled from the society of and intercourse with their fellow-men. Until the revolution the Cagots were not liberated from legal restrictions. Some remains of them, or of corresponding outcasts, are to be found under various names in different parts of France. Similar remains of pariah races are also found among the mountains of North Spain. See Michel, Histoire des Races Maudites de la France et de l'Espagne (two vols. Paris, 1847).

CAHIR, or Caher, an inland town, Ireland, county Tipperary, on the Suir, about 10 miles W. by N. of Clonmel. It is well built, and exceedingly neat and clean; its general appearance being greatly improved by the Suir, here a clear and beautiful stream spanned by a fine bridge. The public buildings are all handsome, and being placed, most of them, in conspicuous situations, have a very fine effect. About 1 mile from the town is a barrack, capable of accommodating a regiment of cavalry, and which, being generally occupied, adds much to the gaiety and bustle of the place. The old picturesque castle of Cahir, an object of considerable interest, occupies the summit of a rock, which rises over the left bank of the river. A considerable trade is done here in corn, and its various fairs and markets are well attended. The mansion of the Glengall family is in the town, its beautiful and finely-wooded domains intersected by the Suir. Pop. (1891), 2046.

CAHORS (ancient *Cadurcum*), a town in France, capital of the department of Lot, and on the river of that name, 60 miles north of Toulouse. It is nearly surrounded by the river, and communicates with the opposite shore by three bridges, one of which is ancient. Before the conquest of Gaul by Cæsar it was the capital of the Cadurci, and under the Romans, who gave it the name of Divona, it was adorned with a temple, theatre, baths, an immense aqueduct, and forum. Several Roman roads can still be traced in its vicinity. Among the principal edifices are the cathedral, an irregular structure, supposed to be partly Roman; an episcopal palace, now converted into the prefecture; three old churches; barracks; a theatre; and a lyceum or college. Cahors had formerly a university, which was united with that of Toulouse in 1751. It was founded in 1322 by Pope John XXII., a native of the town. The celebrated jurist Cujas was a professor, and Fénelon a student in it. To the latter an obelisk has been erected. The manufactures are insignificant; but a considerable trade is carried on in the red wine of the district, and in brandy. Coal is worked in the vicinity. Clément Marot, the poet, was born here. Cahors was given up to the English by the treaty of Brétigny in 1360. It revolted, and returned to France in 1428. Pop. (1896), 10,882.

CAIAPHAS, a Jew, was the high-priest at the time when the crucifixion took place. Previously, when the resurrection of Lazarus had spread dismay among the Jewish functionaries, it was Caiaphas who suggested the expediency of putting our Saviour to death, and when he was arrested in Gethsemane he was carried first to Annas, and then to Caiaphas, from whom he was transferred to the hands of the civil authority. Caiaphas was deposed A.D. 35, and Jonathan appointed in his stead.

CAICOS, CAYOS, or The Keys (from the Spanish *cayo*, a rock, shoal, or islet), one of the island groups comprehended under the general name of the Bahamas, belonging to Great Britain, consisting of six islands besides some uninhabited rocks; between lat. 21° and 22° N. and lon. 71° and 73° W. The largest, called the Great Key, is about 30 miles long. They are wooded and tolerably fertile, and at one time produced cotton, but at present the inhabitants are few in number, and mostly engaged in fishing and the preparation of salt. In 1873 the Turks Islands and the Caicos were united into a commissionership under the governor of Jamaica.

CAILAS, Cailasa, or Kailasa, a ridge of the Himalaya Mountains. See Himalaya.

CAILLE, Nicholas Louis de la. See Lacaille.

CAIMAN, or Cayman, a term equivalent to *alligator*, and used generally throughout Spanish America. See Alligator.

CAIN, the eldest son of Adam and Eve; the first murderer, who slew his brother Abel. For the biblical history of Cain and his descendants see Gen. iv.–vii. The posterity of Cain became extinct at the flood. Cain founded the first city, and his descendants were the first inventors and promoters of the useful and agreeable arts. Josephus relates that he became the leader of a band of robbers, committed all sorts of licentiousness, corrupted the simplicity of primitive manners by his luxury, established the right of property by setting up landmarks, and was the inventor of weights and measures. A Gnostic sect of the second century were called *Cainites*.

CAIQUE, a skiff of a galley. It was pointed at both ends, and was 25 feet long by 6 broad and 2½ deep. It went out of use with the galley. The name is now applied, in the Levant, and particularly in the Bosphorus, to a kind of light boat or skiff used by the Turks, &c.

ÇA-IRA, a popular song of the great French revolution. The origin and date of this song are both uncertain, and there are various versions of the words claiming to be original. In all probability it dates from May or June, 1790. French writers say that Benjamin Franklin, in speaking of the American revolution, frequently used the expression 'Ça-ira' (it will succeed). The French republicans caught up the phrase, and 'consecrated' it to their own revolution in a popular hymn. The air to which it was adapted was the Carillon National, a favourite one with Marie Antoinette. The refrain, or chorus, of one of the versions, runs thus:—

> 'Ah! ça ira, ça ira, ça ira,
> En dépit d' l'aristocrat' et d'la pluie,
> Ah! ça ira, &c.
> Nous nous mouillerons, mais ça finira,'

referring to the rain which fell during the taking of the Bastille.

CAIRN (Gaelic *carn*), a name given to heaps of stones, common in Great Britain, particularly in Scotland and Wales, generally of a conical form. Some are evidently sepulchral, containing urns, stone chests, bones, &c. Others were erected to commemorate some remarkable event, and others appear to have been intended for religious rites. See TUMULI.

CAIRNGORM (that is, 'blue cairn'), a mountain of Scotland belonging to the Grampian Hills, on the border of Banffshire and Inverness-shire, 3 miles north of Ben Macdhui in Aberdeenshire. Its summit is 4084 feet above the level of the sea, and its sides are clothed with pine forests. The group of mountains to which it belongs is known as the Cairngorm Mountains. It is particularly celebrated for the regular, brownish-yellow crystals of quartz found on it and known as *cairngorms*. These are also found in many other places, and are much used for seals, brooches, &c. Specimens weighing a good many pounds are sometimes found. See QUARTZ.

CAIRO (Arabic, *El Kâhira*, The Victorious, or *Masr el Kâhira*), the capital of Egypt and the largest town of Africa, situated on the right bank of the Nile, about 7 miles above the point where it divides to form the two main branches of its delta. The town is built between the river-bank and the north-western end of the hills known as Jebel Mokattam, on whose most advanced spur stands the citadel in a commanding position well above the rest of the city. During the last thirty years the town has lost much of its oriental character, but the Arab quarters still present a maze of very narrow streets lined by curious buildings in endless variety of style. The houses are mostly built of yellow limestone, with flat roofs; and many of them have small gardens behind. In the more modern parts of the city the streets are broader, and many of them are lined by trees and lighted by gas. The European quarter, known as Ismaîlîyeh, forms the western part of modern Cairo, and its centre is the octagonal Ezbekîyeh Garden (20½ acres), with plants from many regions and with an artificial pond. Here, too, are many cafés, concert-halls, and other similar buildings. Among the more notable buildings of the European quarter are the consulates, the opera-house, open in winter, the Italian summer theatre, English and German churches, the ministerial offices, and the barracks. The chief business street of Cairo, known as Muski, runs east-south-eastwards from the neighbourhood of the Ezbekîyeh, and the Boulevard Mehemet Ali extends from about the same place south-eastwards to the citadel. Cairo has more than 500 mosques, but many of them are wholly or partly in ruins. The finest of all is the Sultan Hasan Mosque, a truly noble building with a lofty minaret. Others worthy of mention are: that built in the ninth century by Ahmed ibn Tulûn in imitation of the one at Mecca; the Hakim Mosque, dating from the beginning of the eleventh century; the recently rebuilt Hosen Mosque of the son of Ali, Mohammed's son-in-law; the Sitti-Zeynab Mosque, named after a grandchild of the prophet; the Azhar Mosque, famous for its schools of theology, which are attended by Mohammedans from all parts of the world; and the Alabaster Mosque of the citadel, with the tomb of Mehemet Ali, the finest of the modern mosques. The tombs in the burying-grounds outside the city, many of them in the form of mosques, also deserve mention, especially those known as the tombs of the Caliphs. The most important gate of the city is the Bab-en-Nasr, through which large numbers of pilgrims pass every year on their way to Mecca. The mosques contain valuable libraries, but the chief library of the city is the viceregal one, founded in 1870, and now containing about 60,000 volumes, largely in manuscript. The trade of Cairo is large and the bazaars and markets are numerous, there being special bazaars for gold and silver smiths, tapestry merchants, saddlers, armourers, shoemakers, &c. Besides the numerous Mohammedan places of worship Cairo contains English, French, German, Coptic, and other churches and Jewish synagogues, and there are European schools and hospitals. The Egyptian Institute, founded at Alexandria in 1859, is now located in Cairo. The suburb of Bulak, in the north-west of the town, opposite the island of Bulak, forms the port of Cairo, and its narrow streets present a busy scene of oriental life. The island of Bulak and the left bank of the Nile are reached by a great iron bridge, and there is also a railway and general traffic bridge below the island. To the south-west of the modern town and also on the Nile bank stands the suburb of Old Cairo or Masr el-Atîka. On the left bank of the river, almost directly opposite Old Cairo, is the suburb of Gizeh. It has government buildings, a zoological garden, &c., but its chief attraction is the great Egyptological Museum formerly in Bulak, but removed here in 1889. From Gizeh a road and a tramway lead south-westwards to the famous group of pyramids called the pyramids of Gizeh. On the island of Roda, between Gizeh and Old Cairo, the celebrated Nilometer still stands. Cairo enjoys a very mild climate, and is in consequence visited in winter by many Europeans suffering from chest and lung ailments. Many of these stay at Helwan, a small place about 14 miles south-south-east of the town. Cairo is in railway communication with Alexandria, Damietta, Suez, &c., and with Upper Egypt, and the Fresh-water Canal connects it with Ismailia and Suez. In 1896 electric tramways were introduced in the most important streets. Cairo is the residence of the Khedive, the seat of a Coptic and a Greek Orthodox patriarch, and it contains all the highest public offices of the country. El-Fostat, 'The Tent', now Old Cairo, was founded by Amru, lieutenant of Caliph Omar, in 640 A.D. In 969, when the Fatimite dynasty gained possession of the country, the new city to the north was founded. Saladin surrounded it with walls of stone and built the citadel. He also constructed a wooden aqueduct from the Nile to the citadel, a work afterwards replaced by the still existing aqueduct of stone. Cairo was taken by the French in 1798, and was occupied by the British in 1882, after the battle of Tel-el-Kebir. Pop. (1897), 570,062, including Fellahin, Copts, Turks, Arabs, and other orientals, besides about 25,000 foreigners from the chief European countries, especially Italy, Greece, France, Austria, England, and Germany.

CAISSON, in civil engineering, a kind of water-tight chest or casing, used in the construction of bridges, quays, &c., large enough to contain an entire pier, which is built in it; the caisson being sunk to the bed of the river, and the sides removed from the bottom, which is left as a foundation for the pier. Another kind of caisson has an air-chamber below in which men may work at the bottom of the water, air being forced in to keep the water out, and the air-space being entered by what is called an air-lock. The caisson is used where the water is too deep to permit of the construction of a coffer-dam. The name is also applied to an air-tight structure which is sunk below a vessel by the admission of water, and raises the vessel when the water is pumped out; and to the boat-shaped gate used to close the entrance to a dry dock. See DOCK.

CAITHNESS, the most northern county of the mainland of Scotland, bounded on the north by the Pentland Firth and the Atlantic Ocean, on the west by Sutherlandshire, and on the south and east by the German Ocean. The surface is generally level or undulating, and there are few hills of any height, except on the Sutherland border. Much of the surface is deep moss or peaty moor, but there is a fair proportion of fertile land in the eastern part. Of the total area of 446,017 acres rather more than half is described as mountain and heath land used for grazing. About one-quarter of the whole surface is under crops and rotation grasses, or in permanent pasture. Of corn crops oats is by far the most important. Only a very small portion of the county is wooded, The coast is prevailingly bold and rocky, the chief headlands being Dunnet Head on the north coast, Duncansby Head at the north-east corner, Noss Head and the Ord on the east coast. The largest bays are Dunnet Bay on the north and Sinclair's Bay on the east, but Thurso Bay and Wick Bay are also noteworthy. There are many lakes, some of them very attractive. The largest is Loch Watten, near the centre of the county. Of the rivers only the Thurso and Forss, flowing northwards, and the Wick, flowing into Wick Bay, need be mentioned. Caithness is poor in metallic minerals, but excellent flagstones have been quarried for many years and form one of the chief exports of the county. Many of the inhabitants are engaged in fishing, and Wick is one of the chief centres of the Scottish herring-fishery. The manufactures are mainly subsidiary to its other industries. Wick, the county town, is a royal burgh, and Thurso is the only other town. Both these places are in railway communication by the Highland Railway with the rest of Scotland, and there is regular steamboat communication with Leith, Aberdeen, Orkney, and Shetland. The antiquities of Caithness are numerous, and include old castles, so-called Picts' houses, monoliths, &c. The county returns one member to Parliament, and Wick joins with Kirkwall, Tain, and other places in sending another representative. Pop. (1881), 38,845; (1891), 37,177; (1901), 33,859.

CAIUS, KEY, or KAYE, JOHN, born at Norwich on Oct. 6, 1510, studied at Gonville Hall, Cambridge, of which he was elected a fellow. In 1539 he repaired to Padua, where he studied medicine under J. B. Montanus and anatomy under Vesalius. Graduating M.D. there in 1541, he travelled in Italy, France, Germany, and only returned to England in 1544. On his return he was commanded by Henry VIII. to read lectures on anatomy, in London, and was successively first physician to Edward VI., Mary, and Elizabeth. In 1547 he became a fellow of the College of Physicians, and defended its privileges so ably and strenuously, when the College of Surgeons attempted to encroach on them, that he was appointed president, and retained the appointment for many years. Having obtained permission to erect Gonville Hall into the College which has since been known as Gonville and Caius College, he accepted of the mastership in 1559. In 1568 he was dismissed from his post as chief royal physician on account of his Roman Catholic opinions. Of his numerous works, the most interesting, entitled De Ephemera Britannica, treats of the sweating sickness of 1551. Caius died in London on July 29, 1573.

CAJEPUT (or CAJUPUT) OIL, the volatile oil obtained from the leaves of the cajeput-tree (*Melaleuca Cajuputi* or *minor*), belonging to the order Myrtaceæ. This tree has lanceolate, aromatic leaves and spikes of odourless flowers, and is common in many islands of the Malay Archipelago. Booro, one of the Moluccas, yields the bulk of the oil exported. It is mostly sent to Singapore, whence it is re-exported to other countries. The oil is of a pale-green colour, very limpid, lighter than water, of a strong smell, resembling camphor, and of a strong pungent taste. It is often adulterated with other essential oils. The colour of the oil depends on the presence of a little copper, which must be removed before the oil is fit for use in medicine. Cajeput oil has many applications in medicine, being used as a carminative, an antispasmodic, a rubefacient, and a sudorific. *Kayuputi*, the native name of the tree, means *white wood*, and refers to the colour of the bark.

CAJETANUS, THOMAS DE VIO, takes his name of Cajetanus from the town of Gaeta (Cajeta) in which he was born on Feb. 20, 1469. When only fifteen years of age he became a Dominican monk, and he acquired great reputation by his talents and learning. In 1500 he became procurator-general, and in 1508 general of his order. In 1517 he was made a cardinal and archbishop of Palermo by Leo X., who, in the following year, sent him as his *legatus a latere* to the diet at Augsburg. The principal object of his mission was to endeavour to bring Luther back to the church, before the separation to which he was evidently tending had become final. His mission, as might have been anticipated, ended in failure. Shortly after his return to Italy he was appointed Bishop of Gaeta. He died at Rome on Aug. 9, 1534. Though much employed in public affairs, he appears to have been a hard student, and wrote a number of works.

CALABAR, the former name of a coast district of West Africa extending eastwards from the Niger delta. The name is now applied to two towns and two rivers in that region. Old Calabar is a port in Southern Nigeria, situated on the east bank of the estuary of the Cross River at the point where it receives the waters of the Old Calabar River. It contains, amongst other buildings, a Presbyterian Mission Institute for natives, a large prison, good hospitals, and marine workshops. Its climate, like that of all coast settlements in this part of the continent, is very unhealthy. The rainfall is very great, tornadoes are frequent, and the temperature is very high. The value of its exports, consisting chiefly of palm-oil, palm kernels, and rubber, exceeds £200,000, and its imports are valued at rather more. New Calabar is situated farther west on one of the mouths of the Niger known by the same name. Its trade is less than that of Old Calabar, but is nevertheless of considerable value.

CALABASH-TREE (*Crescentia cujete*), a tree of the West Indies and the continent of America of the order Bignoniaceæ, about the height and dimensions of an apple-tree, with crooked, horizontal branches, wedge-shaped leaves, pale-white flowers on the trunk and branches, and a roundish fruit, from 2 inches to a foot in diameter. The greenish-yellow skin of the fruit incloses a thin, hard, and almost woody shell, which is employed for various kinds of domestic vessels, such as water-cans, goblets, and cups. So hard and close-grained are these shells that when they contain any fluid they may even be put several times on the fire as kettles, without any injury. When intended for ornamental vessels, they are sometimes highly polished, and have figures engraven upon them, which are variously tinged with indigo and other colours. The calabash contains a pale-yellow juicy pulp of an unpleasant taste, which is esteemed a valuable remedy in several disorders, both external and internal. The name of calabash is also given to a species of gourd, also called the bottle gourd (*Cucurbita lagen-*

aria). It is a native of both the East and West Indies, and the humbler inhabitants employ these gourds, which have a hard and tough rind, as ready-made vessels. Sometimes two large gourds fastened on a cross-bar are used to support a man while floating on the water.

CALABOZO, a town of Venezuela, in the state of Guzman Blanco, 120 miles S.S.W. of Caracas, on the left bank of the river Guarico, in the midst of the Llanos. It is tolerably well built, and has rather a pleasing appearance. Its church, though not very handsome, is commodious. The principal wealth of the inhabitants consists of cattle. The neighbouring ponds abound in electrical eels. Pop. 6000.

CALABRESE, the appellation of a painter, by name Mattia Preti, a native of Calabria, born 1613; died 1699. He was chiefly celebrated for his frescoes. He worked for a considerable time in Malta, being employed in executing pictures on the walls of the cathedral. His death took place in Malta.

CALABRIA, the name of a division of the Kingdom of Italy, comprising the S.-W. peninsula or toe of Italy, from about lat. 40° N. to the Strait of Messina; area estimated at 6663 square miles. It was formerly divided into three provinces—Calabria Citra, the most northerly; Calabria Ultra I., the most southerly; and Calabria Ultra II., between the two former; but these have been renamed respectively Cosenza, Reggio, and Catanzaro. The central region is occupied by the great Apennine ridge, wild and bleak, to which, however, whole colonies with their cattle migrate in the summer. The flats near the coast are marshy and unhealthy, and inhabited by herds of buffaloes; but the valleys at the foot of the mountains are delightful, and rich with the most luxuriant vegetation. The vine, the orange and lemon trees, the fig, the olive, and all the fruits of S. climes, grow there to perfection. The climate was reckoned salubrious in ancient times; but in some places the accumulation of stagnant water produces disease in the hot season. During the remainder of the year the heavy dews preserve a delightful verdure, increased by numerous springs and streams. Corn, rice, saffron, anise, liquorice, madder, flax, hemp, olives, almonds, and cotton are raised in abundance. The sugar-cane also comes to perfection here. Sheep, horned cattle, and horses are numerous. Near Reggio a kind of mussel is found, called *Pinna marina*, from whose silky byssus or beard a beautiful fabric is manufactured, remarkable for its extreme lightness and warmth. Coral is also fished. The quarries and pits afford alabaster, marble, gypsum, alum, chalk, rock-salt, lapis lazuli, and the fine copper renowned in ancient times.

Calabria corresponds with the ancient Bruttium and part of Lucania, while the ancient Calabria corresponded to the *heel* of Italy. It early received numerous Greek colonies, which rendered it flourishing, and formed part of the country called Magna Græcia by the ancients. In 268 B.C. it was conquered by the Romans. The Saracens had occupied the greater part of it when it was conquered by the Normans in the eleventh century. Since then it has constantly followed the fate of the Kingdom of the Two Sicilies, with which it was united to the Kingdom of Italy in 1860. It was visited by a great earthquake in October, 1870. The greater part of the inhabitants are poor. Formerly the country was much infested by brigands, who united superstition and ferocity with ignorance, and brigandage is not yet entirely extinct here. The physiognomy of the Calabrese is peculiar, showing some traits of the African races. Their complexion is olive or copper-coloured. The language of the people is a corruption of the Italian, full of original and pointed expressions. Their gestures are extremely lively, and their disposition impulsive and passionate. The poverty of the inhabitants, together with the richness of the country, shows the backward state of civilization. Pop. 1,350,000.

CALADIUM, a genus of plants of the order Araceæ (*arums*), natives of tropical South America, often cultivated in hothouses on account of their large and finely-coloured leaves.

CALAHORRA (anciently *Calagurris*), a town of Spain, in Old Castile, near the S. side of the Ebro, in the province of, and 40 miles E.S.E. of Logroño. Pop. (1887), 8821. It is a bishop's see, and contains three parish churches and three convents. In the year of Rome 682 this town, then called *Calagurris*, siding with Sertorius, was besieged by Afranius, one of Pompey's generals, and the inhabitants reduced to such extremity that they fed on their wives and children; whence the Romans were wont to call any grievous famine *fames Calagurritana.* Quintilian was born here.

CALAIS, a seaport town, and fortified place of the first class, France, dep. Pas-de-Calais, 20 miles N.E. Boulogne, on the Strait of, and about 23½ miles S.E. Dover. It is situated at the junction of several canals, and by railway is directly connected with the metropolis, from which it is distant 185 miles. The town consists of two portions, almost entirely separated by basins or water areas connected with the harbour accommodation. These are Calais proper or the old town farther to the north, and St. Pierre or the new town lying to the south, and incorporated with the other portion only in 1885. The whole is inclosed by a new line of circumvallation, and is also defended by a citadel and detached forts and batteries. On the land side the country is flat and marshy, and can be laid under water to strengthen the defences. The streets are broad and well paved, the houses substantially built of brick, and the hotels in general excellent. The chief square is the Place d'Armes, where the Hotel de Ville, built in 1740 (restored in 1867), is situated. The principal church (Notre-Dame) contains a fine altar-piece in Genoa marble. Other noteworthy objects are the Hôtel de Guise, originally founded by Edward III. of England; the column erected to commemorate the landing of Louis XVIII. in 1814; theatre; barracks; and the Hôtel Dessin. Calais is the seat of a commercial court and chamber of commerce, and has a college, a commercial school, school of design, school of hydrography, &c.

The harbour is accessible at all states of the tide, and is entered between two long piers. Considerable improvement has recently been made in the shipping accommodation at great expense. The new works include a dry or graving dock 426 feet long at bottom, and having a depth of water on the sill of 28 feet 8 inches (at spring tides). There is also a new wet-dock 27 acres in extent, with a depth of 25 feet. Calais is one of the principal ports for the debarkation of travellers from England (who are landed at the new railway-station), there being day and night communication with Dover by steamboat. The number of travellers arriving and departing by sea is considerably over 200,000 per annum. The manufactures of the town, formerly inconsiderable, have risen of late to importance. The silk and cotton tulle or bobbin-net trade now employs about 15,000 artisans. Various other industries are also carried on, such as flax-spinning, engineering, net-making, brewing, &c. Vessels are built here, and fitted out for the cod, mackerel, and herring fisheries. A considerable trade is carried on in grain, wool, wine, sugar, timber, coal, &c., and not less than 55,000,000 of eggs are annually exported to England. Calais is a town of considerable antiquity. In 1347 it was taken by Edward III. of England, after a siege of 11 months. The famous incident of the six burgesses having their lives saved at the intercession of Queen Philippa belongs to this siege. In 1558 it was retaken by the Duke of Guise, being then the last relic of the French dominions of the Plantagenets, which at one time comprehended the half of France. Pop. in 1896, 56,940; in 1901, 59,793.

CALAIS, Pas de, a department of France, comprising the greater part of the former province of Artois, together with several portions of Basse Picardie. It is bounded N. and W. by the Strait of Dover and the English Channel; S. by the department of the Somme; and E. and N.E. by that of Nord. Its area is 2551 square miles. It is divided into the six arrondissements of Arras, Béthune, Boulogne, Montreuil, St. Omer, and St. Pol. The principal towns are Arras (the capital), and the seaports of Boulogne and Calais. The coast is flat, and is protected from the sea by low sand-hills of considerable breadth, which are now being planted with firs; but in the neighbourhood of Boulogne it attains a considerable elevation. The interior is also flat, with a general slope to the N.E. A chain of hills stretches from Abbeville to the slopes of Boulogne. There are several small rivers navigable within the department, besides the canals of Calais, St. Omer, Ardres, and La Marck. There are extensive meadows, and abundance of good soil for the cultivation of cereals, almost half the department being under grain crops, including wheat, oats, barley, &c. Marble, flint, sandstones, potters'-clay, amethysts, and rock-crystal, besides coal and iron, are found beneath the surface. Coal-mines have now been worked for a number of years, and have recently taken a considerable expansion. It contributes about one-third to the total coal production of France. Iron ore is also worked. Beetroot and flax are cultivated, and cheap spirits are extensively made from beet and maize. The manufactures of lace, iron goods, &c., and the ship-building, are important. Pop. (1896), 906,249.

CALAIS, Straits of. See Dover (Straits of).

CALAITE. See Turquoise.

CALAMANCO, a woollen stuff, principally manufactured in the Netherlands. The warp is sometimes mixed with silk or goat's hair. This stuff is made plain, coloured, striped, or watered.

CALAMANDER WOOD, the name given to a beautiful species of hard-wood brought from Ceylon. It is obtained from a kind of ebony-tree (*Diospyros hirsuta*).

CALAMARY. See Loligo.

CALAMIANES, a cluster of islands in the Malay Archipelago, among the Philippines. One of them, Busuanga, is 36 miles long and 17 miles broad. They lie between lat. 11° 25′ and 12° 20′ N.; and about lon. 120° E. The natives in the interior are independent, and are said to live without chiefs and without laws, and to have no fixed places of abode. Those living on the sea-coast submitted to the Spaniards, who used to keep a garrison in the islands. They are mountainous, and produce some rice and great quantities of wax and honey. Pop. 16,000.

CALAMINE. See Zinc.

CALAMITE, a genus of fossil plants very characteristic of the coal measures. Their classification is not finally determined, but they are generally regarded as closely related to the Equisetaceæ or Horse-tails, of which they look like arborescent forms. The stalks are striated lengthwise, and interrupted from distance to distance with rings marking a regular articulation. Brongniart connects them with the Coniferæ and the Cycadeæ.

CALAMUS, a remarkable genus of palms, species of which furnish the well-known rattan canes and dragon's-blood (see those articles). The plants of this genus belong to the East Indies and are very different from most other palms, having slender, many-jointed, reed-like stems, often stretching to an enormous length, as much as 1000 feet being attained by some. Some have the stems erect, others climb and trail among other trees on which they support themselves, hanging on by the hooked prickles that terminate their leaves. Some have leaves at intervals along the stem, others only at the extremity, and Sir J. E. Tennent mentions having seen one 250 feet long without the slightest irregularity and with only a bunch of feathery leaves at the top. The stems are hard, smooth, and siliceous on the surface, and from their toughness and pliancy they are much used in the countries where they grow for matting, strong ropes, plaited work, &c. Bridges over streams are frequently made of ropes formed by twisting up their stems, and the native vessels of the eastern seas often carry cables of the same kind. A species of Calamus (*C. equestris*) is shown on the plate at the article Palms. The *Calamus aromaticus* of the ancients, a plant with supposed medicinal virtues, came from the East, but it is not certain to what plant they applied the name.

CALAMY, Edmund, a Presbyterian divine, distinguished for his influence in ecclesiastical affairs in the early half of the seventeenth century, was born in London in 1600, and educated at Pembroke Hall, Cambridge. After holding several posts in the church he was about 1640 appointed rector of Rochford, Essex, and about that time he became perpetual curate of St. Mary, Aldermanbury. He engaged warmly in the religious disputes of the day, and was one of the writers of the famous treatise against some of the pretensions of Episcopacy, written under the pseudonym of Smectymnuus, a name formed of the initials of its five authors. Calamy adopted a moderate attitude during the period of the civil war and commonwealth, and became chaplain-in-ordinary to the king at the restoration. He died in 1666.—His son, Dr. Benjamin Calamy, became an Episcopal clergyman, and distinguished himself by the publication of A Discourse about a Scrupulous Conscience, 1683.—The grandson of Edmund Calamy the elder, Edmund Calamy, was born in 1671, and became pastor of a large congregation in Westminster. He died in 1732. He published an abridgment of Baxter's History of his Life and Times, with a continuation (four vols. 8vo); the Inspiration of the Scriptures, Life of Increase Mather, &c.; and also carried on through the press controversies with Bishop Hoadly and others.

CALAS, Jean, an unfortunate man who was born in 1698, near Chartres, in Languedoc. Brought up in the Protestant religion, he had established himself as a merchant in Toulouse. He had four sons and two daughters whom he educated himself, and was held in general esteem, when he was suddenly accused of the crime of murdering one of his sons. In 1761 his eldest son, Marc Antoine, a young man of irregular habits and a gloomy disposition, was found strangled in his father's house. It was reported that the unfortunate youth had been put to death by his father, because he wished to become a Catholic. Jean Calas and his whole family were arrested, and a prosecution instituted against him, in support of which numerous witnesses came forward. The parliament of Toulouse condemned him, by eight voices against five, to be tortured and then broken on the wheel; and on the 9th of March, 1762, the sentence was executed. He suffered the torture with firmness, and protested his innocence to the last. The youngest son was banished for ever, but the mother and servant were acquitted. The family of the unhappy man retired to Geneva. Voltaire, who was then at Ferney, became acquainted with them, and for three years exerted himself to defend the memory of Calas, and to direct attention to the defects of the criminal law. The widow and children of Calas also solicited a revision of the trial. Fifty judges once more examined the circumstances, and declared Calas altogether innocent, 9th March, 1765. The king by his liberality sought to recompense the family for their undeserved losses, and people of the first rank emulated each other in endeavouring to relieve them.

CALATAFIMI, a town of western Sicily, in the district of, and 21 miles E.S.E. of Trapani. It is situated in a mountainous district, near the river Gaggera, is badly built, and has a ruinous castle on the summit of a neighbouring hill, now used as a prison. The environs are well cultivated and extremely fertile. In 1860 a battle took place here between Garibaldi's forces and Landi's Neapolitan troops, in which the latter were defeated. Pop. 10,500.

CALATAGIRONE, or Caltagirone (ancient *Calata Hieronis*), a town of Sicily, in the province of, and 34 miles S.W. of Catania. It stands on two hills, and consists generally of spacious, clean, and well-built streets. There is a fine promenade and market-place, beside which stands the old castle. It is the see of a bishop, and has several churches and a college. Its inhabitants are said to be the best workmen in the island. It has a considerable commerce, and is celebrated for the manufacture of terra-cotta ware. It was fortified by the Saracens, and wrested from them by the Genoese. Roger Guiscard gave it important privileges. Pop. 30,000.

CALATAYUD, a town of Spain, the second city of Aragon, 45 miles S.W. of Saragossa. It stands on the Jalon, near its confluence with the Jiloca, at the foot of two rocky heights crowned with the ruins of Moorish forts. The upper or Moorish town is a very wretched place; but the modern town below is well built, and contains many remarkable edifices, among which the most conspicuous are the church of Santa Maria, once a mosque, and surmounted by an octagonal tower; and that of St. Sepolcro, a Doric structure containing many curious relics. Red wines are produced in the neighbourhood, and about 10 miles from the town there are sulphurous baths. The poet Martial was born at Bilbilis, a former town on the site of the present Bambola, 2 miles E. of Calatayud. Pop. (1887), 11,055.

CALATRAVA, Order of, a Spanish order of chivalry, originated during the Moorish wars. Calatrava la Vieja, taken from the Moors in the 12th century by the king of Castile, was committed to the Templars, who guarded it till 1158. At this time, a powerful army advancing to besiege it, they despaired of being able to defend it, and restored it to the king, who offered it in absolute property to whosoever would defend it. Two monks of the abbey of Cîteaux (Cistercians), in France, presented themselves and were accepted. They preached a crusade, and offered a pardon of sins, and being supplied with money and arms, were able to repel the invaders. Thereupon, having received the investiture of the town and other donations, they instituted the same year (1158) an order into which all the nobility of Castile and Navarre were emulous to enter. In 1164 the chevaliers of this order, by sanction of Pope Alexander III., separated themselves from the monks, and the order became purely military. They still followed the rule of the Cistercians, until Paul III. dispensed them from the vow of chastity. For a long period the order distinguished itself in war, and accumulated great riches. Pope Alexander VI. awarded the grandmastership in perpetuity to the crown of Castile, and from that time it was merely a decoration of the Spanish court.

CALCAR, Jan Stephanus van, a Dutch painter of the school of Jan van Eyck, was born in 1499 at Calcar, in Cleves. His paintings are true to nature. He studied so thoroughly the works of Titian, that their pictures cannot always be distinguished. The Mater Dolorosa, in the Boisserée collection in Stuttgart, a perfect work of art, is by him. Another small picture of his, the Infant Christ with the Shepherds, was a favourite of Rubens. In this piece the light is represented as proceeding from the child. He designed almost all the portraits in Vasari's Lives, and the figures for the anatomical work of Vesalius. He died in Naples, 1546.

CALCAREOUS SPAR. See Lime.

CALCEOLARIA (Latin, *calceolus*, a little shoe, alluding to the form of the corolla), a genus of plants of the natural order Scrophulariaceæ, natives of South America, especially of Chili and Peru. They are characterized by having a corolla with a very short tube, with two lips, concave or shaped like a hood, the upper one very small, the under one greatly inflated. They are common as greenhouse or outdoor plants. There are upwards of sixty species, of which about twenty are cultivated in the gardens of Europe, and their varieties are very numerous. The flowers of the indigenous species are white, yellow, and purple. They are greatly excelled in beauty by the cultivated varieties, which acquire numerous varieties of tint in these colours, and have besides on the lower part of the corolla, the part which bears the strictest resemblance to a shoe, large spots, or innumerable small points of a different colour, which have a very graceful effect. They grow best in a rich, open, sandy garden mould, and are propagated by seeds or cuttings, the herbaceous kinds mostly by the former method.

CALCHAS, a legendary priest and prophet of the Greeks at the time of the Trojan war, who foretold that Troy would not be subdued by them till the tenth year of the siege. He himself accompanied the Greek army to Troy. During the siege, the Greeks were attacked by a plague, and Calchas declared that it was the effect of Apollo's anger, because they had deprived his priest of his daughter Chryseis, whom Agamemnon had selected as his mistress. He counselled the Greeks to appease Apollo by restoring the damsel; and it was by his advice that they afterwards built the wooden horse. There are various legends relating to his death.

CALCINATION, a term now used as practically equivalent to roasting or oxidation. It is derived from the Latin word *calx*, meaning quicklime, and received its present signification by extension from its original meaning of obtaining lime from limestone by the application of great heat. By calcination many substances are reduced to a friable condition, and freed from constituents capable of passing off in the form of gas or vapour. Thus various salts may be deprived of water of crystallization, and rendered amorphous in this way; the hydrated carbonate of magnesium is reduced to the pure oxide, known as *calcined magnesia*; limestone is converted into quicklime; &c. Calcination is usually the first process in the extraction of metals from their ores. The oxides of metals produced by this process were formerly known as calxes, but this term is now disused. It depends on circumstances which oxide is obtained, if the metal, like lead, can form more than one. The weight of the total calx is equal of course to that of the metal and the oxygen with which it has combined, but the calx itself is specifically lighter than the metal. Platinum, gold, silver, and some other metals, are not affected in this way, and on this account they are called the *noble metals*. See Combustion.

CALCITE, or Calcspar, is the native crystallized carbonate of calcium. It is interesting on account of the large number of secondary forms derived from the primitive rhombohedron in which it occurs, as many as 800 having been described. It is abundant and widely distributed. Its colour varies from white to yellow, green, or red. The finest specimens, such as pure Iceland-spar, are transparent and doubly refracting, but it is more commonly translucent or opaque. Before the blow-pipe it is converted into quicklime, which is infusible, but glows brilliantly. It is readily soluble in hydrochloric or nitric acid, the carbonic anhydride escaping with brisk effervescence. Carbonate of calcium crystallizes also in forms derived from a right rhombic prism, so that it is a dimorphous mineral. This variety is known as arragonite, and it differs from calcite not only in its form, but also in its specific gravity, hardness, and other properties. The difference was originally ascribed to the presence of appreciable amounts of carbonate of strontium, and although this was afterwards contested, and it was proved that it was possible for bodies to crystallize in different systems, quite recent investigations into the conditions in which calcite and arragonite can be artificially produced, indicate that, according to the salts of other metals present in the solution, one or other form can be produced, and that one of these modifying metals is strontium.

CALCIUM, in the metallic state, is one of the rarest of substances; combined, it is one of the most abundant and most widely distributed. As phosphate, it forms the main part of the mineral matter of the bones of animals; as carbonate, chalk, limestone, or marble, it forms mountain ranges; as sulphate or gypsum large deposits in various geological formations; it is a constituent of many minerals, as fluor-spar, Iceland-spar, &c., and is found in all soils, in the ash of plants, dissolved in sea-water, and in springs, both common and mineral. The element was got by Sir H. Davy, in 1808, by the galvanic decomposition of the calcic chloride. Other methods for getting it have been since contrived. When quite pure, it is a pale-yellow metal, with a high lustre. It is about one and a half time as heavy as water, ductile and malleable. It slowly absorbs oxygen, especially if watery vapour be present. It reacts with water, forming the oxide or hydrate, and liberating hydrogen. It dissolves very readily in presence of an acid. It combines direct with oxygen and sulphur, and with chlorine, bromine, and iodine, catching fire if the temperature be at all raised. Its salts are for the most part insoluble or sparingly soluble in water, but dissolve in dilute acids. Of the soluble salts, the chloride and nitrate are the commonest. The former on being heated shines in the dark. See Lime.

CALCULATING MACHINES, machines or contrivances by which the results of arithmetical operations may be obtained by inspection, such as the Roman abacus, Napier's bones, the sliding rule, the machines invented by Pascal, Dr. Roth, and M. Thomas of Colmar (the arithmometer), all of which perform only addition and subtraction along with multiplication and division, and the more complicated ones invented for more difficult operations by Babbage and by G. and E. Scheutz. For an account of Babbage's machine, see Arithmetic.

CALCULUS, The Infinitesimal, or Transcendental Analysis, a branch of mathematical science. The lower or common analysis contains the rules necessary to calculate quantities of any definite magnitude whatever. But quantities are sometimes considered as varying in magnitude, or as having arrived at a given state of magnitude by successive variations. This gives rise to the higher analysis, which is of the greatest use in the physico-mathematical sciences. Two objects are here proposed: First, to descend from quantities to their elements. The method of effecting this is called the *differential calculus*. Second, to ascend from the elements of quantities to the quantities themselves. This method is called the *integral calculus*. Both of these methods are included under the general name *infinitesimal* or *transcendental analysis*. Those quantities which retain the same value are called *constant;* those whose values are varying are called *variable*. When variable quantities are so connected that the value of one of them is determined by the value ascribed to the others, that variable quantity is said to be a *function* of the others. A quantity is *infinitely great* or *infinitely small*, with regard to another, when it is not possible to assign any quantity sufficiently large or sufficiently small to express the ratio of the two. When we consider a variable quantity as increasing by infinitely small degrees, if we wish to know the value of those increments, the most natural mode is to determine the value of this quantity for any given period, as a second of time, and the value of the same for the period immediately following. This difference is called the *differential* of the quantity. The *integral calculus*, as has been already stated, is the reverse of the *differential calculus*. There is no variable quantity expressed algebraically, of which we cannot find the differential; but there are differential quantities which we cannot integrate: some because they could not have resulted from *differentiation;* others because means have not yet been discovered of integrating them.

Newton was the first discoverer of the principles of the infinitesimal calculus, having pointed them out in a treatise written before 1669, but not published till many years after. Leibnitz, meanwhile, made the same discovery, and published it to the world before Newton, and independently of Newton's prior discoveries, with a much better notation, which is now universally adopted. The methods analogous to the infinitesimal analysis previously employed were that of *exhaustions* known to the ancients, that of *indivisibles* of Cavalieri, and Descartes' method of *indeterminates*. Leibnitz considered the differences of the variable quantities as infinitely small, and conceived that he might reject the higher powers of those differences without sensible error; so that none of those powers but the first remained in the differential equation finally obtained. Instead of the actual increments of the *flowing* or variable quantities, Newton introduced the *fluxions* of those quantities; meaning, by fluxions, quantities which had to one another the same ratio which the increments had in their ultimate or evanescent state. The *fluxions* of Newton corresponded with the *differentials* of Leibnitz; and the *fluents* of the former with the *integrals* of the latter. The fluxionary and the differential calculus are therefore two modifications of one general method. The problems which relate to the *maxima* and *minima*, or the greatest and least values of variable quantities, are among the most interesting in mathematics. When any function becomes either the greatest or the least, it does so by the velocity of its increase or decrease becoming equal to nothing: in this case, the fluxion which is proportional to that velocity must become nothing. By taking the fluxion of the given function, and supposing it equal to nothing, an equation may be obtained in finite terms.

expressing the relation of the quantities when the function assigned is the greatest or least possible. The new analysis is peculiarly adapted to physical researches. The momentary increments represent precisely the forces by which the changes in nature are produced; so that this doctrine seemed created to penetrate into the interior of things, and take cognizance of those powers which elude the ordinary methods of geometrical investigation. It alone affords the means of measuring forces, when each acts separately and instantaneously, under conditions that can be accurately ascertained. In comparing the effects of continued action, variety of time and circumstance and the continuance of effects after their causes have ceased introduce uncertainty, and render the conclusions vague and unsatisfactory. The analysis of infinites here goes to the point; it measures the intensity or instantaneous effort of the force, and removes all those causes of uncertainty. It is by effects, taken in their nascent or evanescent state, that the true proportion of causes must be ascertained. See Théorie des Fonctions Analytiques par Lagrange; De Morgan's Differential and Integral Calculus; Two School Treatises by Isaac Todhunter: one on the Differential, the other on the Integral Calculus; Prof Price on the Infinitesimal Calculus.

CALCULUS, or STONE, is the name given to certain hard morbid concretions, formed in the bodies of animals. Calculi may be divided into two classes, according as they are found in the gall-bladder or in the urinary bladder. The first are called *biliary calculi*, the second *urinary calculi*.

Biliary calculi are of a lamellated structure, and contain a substance first fully examined by Chevreul, who termed it *cholesterin* (from Gr. *cholē*, bile, and *sterros*, solid). It is a white crystalline substance, and has been detected in the bile, in the blood, brain, yolk of egg, and in many morbid concretions. (See CHOLESTERIN.) Besides cholesterin, biliary concretions contain a portion of inspissated bile, and the yellow colouring matter of the bile in a concentrated state, which, from the beauty of its hue, and its permanence, is much valued as a pigment. (See BILE.) Biliary calculi are more frequent in women than in men, and they occur usually after the age of thirty. They cause sudden and severe spasms of pain, the pain being felt in the neighbourhood of the pit of the stomach and extending lower down and through to the back. Sickness, vomiting, and often fainting are produced, the attack being often known as *biliary colic*; and if the bile duct is blocked up jaundice results. The medical treatment consists in relieving pain and relaxing the parts as much as possible by large hot poultices or the like, so as to aid the passage of the stone. A person who has had one attack is always liable to another.

Urinary calculi are of very variable characters and composition. The following substances enter principally into their composition: uric acid, urate of ammonium, phosphate of calcium, phosphate of ammonium and magnesium, oxalate of calcium, silicic acid, sometimes oxide of iron and animal matter—these being more or less pure or mixed, and being often diversified by mechanical structure, so as to render it difficult to constitute well-defined species. In all these calculi, besides the saline matter, there is present a portion of animal matter. The painful ailment known as *stone* or *gravel* is caused by urinary calculi, the concretions being larger in the former case than in the latter. These may be formed in any part of the urinary organs from the kidney to the bladder. There may thus be stone in the kidney or stone in the bladder or both, and one or both kidneys may be so affected. The size of the stone may vary from that of a pin's head to that of a goose's egg. Stone in the kidney often gives rise to very intense pain, especially if it attempts to pass down the ureter to the bladder, the pain being accompanied by sickness and vomiting, and frequently fainting and collapse. When the stone is in the bladder it may be crushed to fragments by means of an instrument introduced (*lithotrity*); or it may be removed entire through an opening made by cutting into the bladder (*lithotomy*).

CALCUTTA (literally, the ghaut or landing-place of Kâli, from a famous shrine of this goddess), capital of British India, and of the presidency and province of Bengal, is situated on the left bank of the Hooghly (Húglí), a branch of the Ganges, about 80 miles from the Bay of Bengal. The Hooghly is navigable up to the city for vessels of 4000 tons or drawing 26 feet. The navigation, however, on account of sand-banks which are continually changing their size and position, is dangerous, and ships must take on board a pilot. The river opposite the city varies in breadth from rather more than a quarter to three-quarters of a mile. The city may be said to occupy an area extending along the river for about 5 miles from north to south, and stretching eastward to a distance of nearly 2 miles in the south, narrowing in the north to about half a mile. The eastern boundary is nominally formed by what is known as the Circular Road, the Lower Circular Road forming part of the southern boundary. Another eastern boundary on the north is the Circular Canal, which runs for some distance parallel to the Circular Road. The south-western portion of the area thus spoken of is formed by the Maidan, a great park stretching along the river-bank for about 1¾ miles, with a breadth in the south of 1½ miles. This grassy and tree-studded area is one of the ornaments of Calcutta, and is much frequented by all classes. It is intersected by fine drives, and is partly occupied by public gardens, a cricket-ground, race-course, &c., and partly by Fort William, which rises from the river-bank. It was built in 1757–73, being begun by Clive after the battle of Plassey, and is said to have cost about £2,000,000 sterling. Along the river-bank there is a promenade and drive known as the Strand Road, which has for the most part been reclaimed from the river by successive embankments. Along the east side of the Maidan runs Chauringhi Road, which is lined with magnificent residences, about 60 of them occupying 1½ miles from north to south. This line of noble structures forms the front of the European fashionable residential quarter, the rest of which extends back from Chauringhi Road and is intersected with several fine streets. Along the north side of the Maidan runs a road or street known as the Esplanade, on the north side of which are Government House, the town-hall, and high court. The European commercial quarter lies north of the Esplanade, between it and another street called Canning Street, having the river on the west. The centre of this area is occupied by Dalhousie Square (inclosing a large tank or reservoir), and here there are a number of public buildings, including the post-office, telegraph-office, custom-house, Bengal secretariat, &c. The European retail trading quarter occupies a small area to the east of the above area. Everywhere outside of the European quarters Calcutta is interspersed with *bastis*, or native hamlets of mud huts, which form great outlying suburbs. 'The growth of the European quarters, and the municipal clearings demanded by improved sanitation, are pushing these mud hamlets outwards in all directions, but especially towards the east. . . . They have given rise to the reproach that Calcutta, while a city of palaces in front, is one of pig-styes in the rear.' First among the public buildings is

Government House, the viceregal residence, situated, as already mentioned, on the Esplanade. It was built in 1799–1804, and with its grounds occupies six acres. It is a magnificent pile, with four wings extending towards the four points of the compass from a central mass which is crowned with a dome and approached from the north by a splendid flight of steps. Besides accommodating the viceroy and his staff it contains the council-chamber in which the supreme legislature holds its sittings. Nearer to the river stands the high court, an imposing structure in the Gothic style, completed in 1872. Between these two edifices is the town-hall, a large building in the Doric style, built in 1804, having a grand portico approached by a noble flight of steps. The bank of Bengal, the currency office, post-office, &c., are among the other public buildings in this locality, while further to the north stands the mint, near the bank of the Hooghly. The chief of the Anglican churches in Calcutta is the cathedral of St. Paul's, at the south-eastern corner of the Maidan, a building in the 'Indo-Gothic' style, with a tower and spire 201 feet high, consecrated in 1847. ('As late as the second half of the last century, Warren Hastings shot tigers in the jungle that now forms the fine open space upon which the cathedral is built.') St. John's Church, or the old cathedral, is another important church, in the graveyard surrounding which is the tomb of Job Charnock, founder of Calcutta. The chief presbyterian church is St. Andrew's or the Scotch Kirk, a handsome Grecian building with a spire. The Roman Catholics have a cathedral and several other churches; and there are also places of worship for Greeks, Parsees, and Hebrews. Hindu temples are numerous but uninteresting; among the Mohammedan mosques the only one of note is that which was built and endowed by Prince Ghulam Mohammed, son of Tippoo Sultan. The religious, educational, and benevolent institutions are numerous. Various missionary and other religious bodies, British, European, and American, are well represented. There are four government colleges the Presidency College, the Sanskrit College, the Mohammedan College, and the Bethune Girls' School. There are five colleges mainly supported by missionary efforts; besides several others, some of them under native management. Other educational institutions include Calcutta Medical College, a government school of art, Campbell Vernacular Medical School, and a school of engineering at Howrah, on the western side of the river. Besides these there is the Calcutta University, an examining and degree-conferring institution. Among the hospitals are the Medical College Hospital, the General Hospital, the Mayo Hospital (for natives), and the Eden Hospital for women and children. The Martinière (so named from its founder, General Martin, a Frenchman in the Company's service) is an important institution for the board and education of indigent Christian children. Elementary and other schools are increasing in numbers. In this connection we may mention the Asiatic Society, founded by Sir W. Jones in 1784, for the study of the languages, literature, antiquities, &c. of Asia; and the Botanic Garden, which occupies a large area on the right bank of the river. Calcutta possesses a number of public monuments, most of them in or about the Maidan. Several governors-general are thus commemorated, as also Sir David Ochterlony and Sir James Outram, 'the Bayard of the East', of whom there is an admirable equestrian statue by Foley. The city is lighted partly by gas, partly by electricity. There is an extensive system of tramways. The sanitation of Calcutta, though vastly improved in recent years, is still defective, more especially in the suburban districts, where the *bastis* or native huts are so common. One difficulty in the way is the site of the city itself, which is practically a dead level. An act which came into force in 1889 brought a large additional area under the municipal authorities, and since then much has been done in the way of drainage, opening up of arterial streets, alignment of roads, &c. The water-supply has also been greatly increased, and filtered water from the Hooghly (there is a pumping-station at Palta, 16 miles above Calcutta) is now available at the daily rate of 36 gallons per head in the city, and over 15 in the suburbs, besides a supply of unfiltered water for washing and other purposes. The mortality over the entire municipality in 1893 was 29·5 per 1000, a great improvement on former times. The death-rate is far higher among the natives than among the Europeans, and in the native quarters cholera is said to be seldom entirely absent. The healthiest months are July and August, which form part of the season of the rains; the unhealthiest are November, December, and January. The mean temperature is about 79°, the average rainfall a little over 66 inches. Calcutta belongs to an area that is subject to periodical cyclones, which sometimes do an immense amount of injury. One of the most violent of these was in 1864, when enormous damage was done to the town and the shipping in the river, with great loss of life. Out of 195 vessels only 23 remained uninjured, many being totally wrecked. The port of Calcutta extends for about 10 miles along the river, and is under the management of a body of commissioners. Opposite the city it is crossed by a great pontoon bridge, which gives communication with Howrah for vehicles and foot-passengers, and can be opened at one point to let vessels pass up or down. It cost £220,000. Besides the accommodation for shipping furnished by the river, there are also several docks. The trade is very large, Calcutta being the commercial centre of India. There is a very extensive inland trade by the Ganges and its connections, as also by railways (the chief of which start from Howrah), while almost the whole foreign trade of this part of India is monopolized by Calcutta. In 1897–98 the gross tonnage of the shipping inward and outward was over 5,000,000 tons; while the total of exports and imports was 71,994,608 tens of rupees, the exports being largely in excess of imports. The chief exports are opium, jute and jute goods, tea, grain and pulse, oil-seeds, raw cotton, indigo, hides and skins, silk and silk goods, &c. The most important import is of cotton goods. The jute manufacture is extensively carried on, also that of cottons.

The first factory in Bengal of the East India Company, which was incorporated by royal charter in the year 1600, was established at Hooghly, 28 miles further up the river, in 1644. Job Charnock, the Company's agent, was driven out of this settlement in 1686, and the English then occupied part of the present site of Calcutta, which in 1689-90 became the head-quarters of the commercial establishments of the Company in Bengal. In 1700 the Company acquired from Prince Azim, son of the Emperor Aurengzebe, the three villages of Sutánati, Kalikata (Calcutta), and Govindpore, for an annual rent of 1195 rupees, and these formed the nucleus of the present city. The original Fort William, named after William III., was built in 1696, on a site considerably to the north of the present fort. Calcutta was taken and plundered by Suraj-ud-Dowlah in 1756, and retaken by Lord Clive in 1757. To the capture by Suraj-ud-Dowlah belongs the episode of the 'Black Hole' of Calcutta, when 146 Europeans were crowded into a cell 20 feet square, and next morning only 23 came out alive. When the British recovered possession, much of the town was in ruins and had to be rebuilt, so that it may be said to date only from 1757. Clive built the new Fort William on the site of Govindpore, between 1757 and 1773. In 1773 Calcutta became the seat of British government for the whole of India. Since then the history of Calcutta has been an almost unbroken record of progress and prosperity. The pop. in 1872 of the city proper was 447,601; in 1881 it was 433,219, or, including the suburbs and Howrah, 789,864; in 1891, including Howrah (116,606) and other suburbs, the total was 857,750; in 1901, 1,121,664.

CALDARA, ANTONIO, a celebrated Italian composer, was born at Venice in 1670, and died as musical director to the Austrian court in 1736. His compositions are more numerous than original, but some of his church pieces are still in repute.

CALDARA, POLIDORO, called *Caravaggio*, an eminent painter, was born in 1495 at Caravaggio, in the Milanese. He went to Rome in his youth and carried bricks at first for the masons who worked in the Vatican. He first felt a great desire to become a painter from seeing Giovanni da Udine and the other painters who were occupied in the Vatican. He formed a close friendship with Maturin of Florence, who assisted him with his advice. Caldara soon surpassed him, and exerted himself to introduce improvements in drawing, having always in view the antiques. Raphael employed him in the galleries of the Vatican, where he painted, under his direction, several excellent friezes. At Messina he executed an oil-painting, which represents Christ bearing the cross, contains a number of beautiful figures, and proves his ability to treat the most elevated subjects. He has approached more than any one to the style and the manner of the ancients, particularly in imitating their bass-reliefs. His figures are correct, well distributed and arranged; the positions are natural, the heads full of expression and character. It is evident that he would have acquired great celebrity if he had undertaken greater works. He applied himself to the *chiaroscuro*, particularly to that kind of it which is called *sgraffiato*. He showed, also, much talent in his landscapes. At the sack of Rome in 1527 he fled to Naples, and on his return from that place to Rome in 1543 he was murdered by his domestic.

CALDAS DE MONBUY, a small town in Catalonia, Spain, about 20 miles N. of Barcelona. It contains hot mineral springs of such a temperature that the inhabitants bring eggs, vegetables, &c., to boil them in the water. When cooled, it is drunk for scrofulous and rheumatic complaints. Pop. 2409.

CALDER, WEST, a town lying in the parish of the same name, in the S.W. extremity of the county of Edinburgh. The parish abounds in coal, ironstone, and shale, from which of late years great quantities of oil have been obtained. The extensive oil-works of Addiewell, which have been established in the immediate neighbourhood, have contributed greatly to the prosperity of the district, and already a thriving town has sprung up. Pop. of parish in 1861, 1927; of town in 1881, 2291; in 1891, 2516; parish 8456.

CALDERA, a sea-port of Chili, 50 miles N.W. of Copiapó, to which there is a railway. It has risen since 1850 as an outlet for the produce of the rich copper mines in the interior. The town is well laid out, and has some handsome houses and buildings. A mole has been formed in the harbour. Pop. 4000.

CALDERARI (*kettle* or *boiler makers*), a secret society which sprung up in Naples on the restoration of the Bourbons. The Calderari were, according to some accounts, an off-shoot from the Carbonari, a society which had in view the political union of Italy and its liberation from foreign dominion. They appear to have separated from the parent society about 1818, and soon exhibited the most violent antipathy to it. On the restoration of Ferdinand IV., Prince Canosa, the minister of police, attempted to organize them under government patronage as a counterpoise to other secret societies, and particularly the Carbonari. The attempt led to various scenes of violence. It was abandoned and the minister dismissed in June, 1816, after he had been six months in office.

CALDERON DE LA BARCA, DON PEDRO, descended from an ancient family, was born at Madrid, Jan. 17, 1600, received his early education in the Jesuits' College of his native city, and studied at Salamanca, where he devoted himself chiefly to history, philosophy, and jurisprudence. His poetical genius early discovered itself. Before his fourteenth year he had written his third play, El Carro del Cielo (vol. ix. of his works). His talent for this species of poetry, which has brought his name down to posterity, and perhaps his powers of invention in the preparation of entertainments for festivals, soon gained him friends and patrons. When he left Salamanca in 1625, to seek employment at the court of Madrid, many noblemen interested themselves in bringing forward the young poet. But having an inclination for the military profession, he entered the service in 1625, and bore arms with distinction for ten years in Milan and the Netherlands. From these countries, it has been observed, he usually drew his heroes of comedy. In 1636 he was recalled by Philip IV., who gave him the direction of the court entertainments, and, in particular, the preparation of plays for the court theatre. The next year he was made knight of the order of Santiago, and he served in 1640 in the campaign in Catalonia. The unexpected termination of the war restored him again to his peaceful occupation. The king now conferred on him a monthly pension of thirty *escudos de oro;* but he still employed his talents with unintermitted industry in composing for the theatre and the church. The king spared no cost in the representation of his theatrical pieces. Ten years after, in 1651, he procured permission from the order of Santiago to enter the clerical profession, and in 1653 obtained a chaplain's office in the archiepiscopal church at Toledo, without quitting, however, his former occupation. But as this situation removed him too far from court, he received, in 1663, another at the king's court chapel (being still allowed to hold the former); and at the same time a pension was assigned him from the Sicilian revenue. His fame greatly increased his income, as he was solicited by the principal cities of Spain to compose their *autos sacramentales*, for which he was liberally paid. He bestowed particular pains on the composition of these pieces, and, in fact, eclipsed all that the Spanish literature, so rich in this department of fancy, had hitherto produced. These subjects were particularly suited to his religious turn of mind; and he set a peculiar value on his performances of this kind, so as even to disparage his other works, which deserve no mean reputation. Religion is the ruling idea, the central point, of his poems. Whatever subject he handles he exhibits true poetical genius. Even allowing that he is inferior in richness of invention to Lope de Vega, he certainly excels him in fineness of execution, elevation of feeling, and aptness of expression. If we find in him much that is foreign to our modes of thinking and feeling, to our accustomed views and manner of expression, we shall have occasion much oftener to admire his unrivalled genius. The Spanish nation esteem Calderon among the greatest poetical geniuses. Many faults in his writings are to be attributed to the age and circumstances of the author. Among his dramatic works are many pieces of intrigue, full of complicated plots and rich in interesting incidents

There are, besides, heroic comedies and historical plays, some of which merit the name of tragedies. To this class belongs the Constant Prince, which deserves an honourable place among romantic tragedies of the first rank. Besides these, Calderon has left ninety-five *autos sacramentales*, 200 *loas* (preludes), and 100 *saynetes* (farces). He wrote his last play in the eightieth year of his age. The smaller poems of Calderon, his songs, sonnets, ballads, &c., notwithstanding the applause which they received from his contemporaries, are now forgotten; but his plays have maintained their place on the stage even more than those of Lope de Vega. The number of his collected plays amounts to 128. He wrote, however, many more, some of which were never published. The most complete edition of his works is that published by D. Juan de Vera Tassis y Villarroel (Madrid, 1685, nine vols.) The Constant Prince shows, perhaps, in the highest degree Calderon's tragic powers. It turns on one of the most perplexing of all subjects, viz. the idea of destiny, managed in a truly poetical way, in a tragedy terminating happily. The great fertility of Calderon's invention has heaped up an abundance of materials from which foreign theatres might be much enriched. It is to be regretted that his works have not been chronologically arranged. We might then have traced the growth of mysticism in his mind, and seen it striking root more deeply as he advanced in life. At the age of sixty-two he was admitted into the fraternity of San Pedro. Before his death he was elected their *capellan mayor*. He left them all his property, for which they erected a splendid monument to his memory. He died May 25, 1681. Among his imitators, Tirso de Molina is worthy of mention, as the author of the Inflexible Stranger, which has been often imitated. He also found imitators among his rivals in other countries. Corneille and Molière are believed to have built some of their renowned productions upon the foundations he had provided. See The Spanish Drama, by G. H. Lewes (1846). An edition of his dramatical works, *Teatro Completo*, has been published at Madrid in four vols. 8vo, 1848-50.

CALDERWOOD, DAVID, an eminent Scottish divine and ecclesiastical historian in the reign of James VI. The date of his birth is uncertain. In 1604 he was settled as a minister of Crailing, in Roxburghshire, where he distinguished himself by his opposition to episcopal authority. In 1617 he was banished the realm for his contumacy, and went to Holland, where, in 1623, he published his famous work entitled Altare Damascenum. Some time afterwards he returned to Scotland, and became minister of the church of Pencaitland, near Edinburgh. He then engaged in writing the history of the Church of Scotland, in continuation of that of Knox, a work which was published from his MS. in 1842-49 in eight vols. He died about 1651.

CALEB, son of Jephunneh, a descendant of the tribe of Judah, or according to some authorities a foreigner of Kenezite origin incorporated with that tribe, according to Ussher born B.C. 1530, was sent with Joshua and ten others to examine the land of Canaan. When Joshua had conquered the country, Caleb reminded the Jews of the promise which had been made by God, that they should enjoy this country. He obtained the city of Hebron for his share of the spoil, besieged and captured it, and drove out three giants, or Anakim. He then marched against Kirjath-sepher, and offered his daughter Achsah to the first who should enter it. Othniel, his nephew, was the successful aspirant for the fair Jewess.

CALEDONIA, CALEDONIANS, the names by which the northern portion of Scotland and its inhabitants first became known to the Romans. The year 80 of the Christian era is the period when Scotland first becomes known to history. The invasion of Cæsar did not immediately lead to the permanent occupation of Southern Britain. It was only in the year 43 that the annexation of this portion of the island to the Roman empire began. It was completed superficially about 78, and two years were occupied in reconciling the natives to the Roman yoke. Agricola then moved northward, invading Scotland by the eastern route, and occupying the country up to the line of the Friths of Clyde and Forth. Agricola ran defensive works across this line, and hearing, in the third year of his occupation, rumours of an organized invasion in preparation by the Caledonians, a name applied to the dwellers N. of the boundary, he resolved to anticipate them, and again advanced northward. The Roman army marched in three divisions. The weakest, consisting of the ninth legion, was attacked by the barbarians, who fought their way to the Roman camp. Agricola came to the rescue, and the Romans were victorious. The Roman army now advanced to Mons Grampius, where they found the enemy, 30,000 strong, under a chief named Galgacus. Agricola had to stretch his line as far as he deemed prudent to prevent being outflanked. The auxiliaries and Romanized Britons were in the centre and front, the legions in the rear. The Caledonians are described as riding furiously about in chariots between the two camps. Each chief (Roman and Caledonian) made a set speech to his followers; that of Galgacus was peculiarly eloquent. The Caledonians were armed with small shields, arrows, and large pointless swords. Their chariots routed the Roman cavalry, but afterwards became embarrassed in the broken ground; and when the Roman auxiliaries charged the masses of the enemy with the gladius, they gave way before a method of fighting to which they were unaccustomed. Some further manœuvres occurred, but the victory of the Romans was complete. It does not appear, however, to have been productive of great effects, as next morning the enemy had entirely disappeared. Such is the account given by Tacitus of the only one of the numerous battles between the Romans and the Caledonians of which we have a detailed description. The site of the battle remains undetermined, and the origin of the name Caledonian remains in equal obscurity. Various derivations are given of the word, but whether it was a native term, and to what exact people it applied, cannot with certainty be determined. The name Caledonian is first used by Pliny, who, as well as Tacitus, is supposed to have derived it from Agricola. The name is applied by Ptolemy to one of the numerous populations of North Britain. The use of the name by Tacitus gave it immediate popularity with the Romans, and to the same source its subsequent popularity in Britain is to be traced. Its historical importance is therefore exclusively limited to this first mention of it. See Dr. Smith's Dictionary of Greek and Roman Geography, and Burton's History of Scotland.

CALEDONIA, NEW, the name once borne by a country of North America, W. of the Rocky Mountains, 500 miles long from N. to S., and 400 from E. to W. The country is now included in British Columbia.

CALEDONIA, NEW (*Nouvelle Calédonie*), a French island in the Pacific Ocean, lying between the parallel of 20° S. and the Tropic of Capricorn, some 700 miles E. of Australia. Its length N.W. to S.E. is 250 miles, the breadth being about 35 miles. The area is 6500 square miles. It is surrounded by coral reefs, at a distance of from 5 to 18 miles. It was discovered by Cook in his second voyage (1774), who remained on the coast a week. D'Entrecasteaux was the first who sailed completely round it (1791 and 1793). Two parallel ranges of mountains extend through the island, attaining in the north a height of 5570 feet. The soil is fertile, and the island produces the bread-fruit tree, banana, sugar-cane, arum, cocoa, and excellent timber. The climate is healthy. Iron, copper, cobalt, nickel, silver, mercury, antimony, and gold have been discovered in recent years, and the nickel mines are now an important source of this metal. Coal is also found in abundance. The animals are very few, mammals and reptiles being specially deficient. The natives, known as Kanakas, were formerly given to cannibalism. They are armed with darts and clubs, but do not use the bow. Their huts are small, circular, and well built, with conical tops. Their numerous languages are described as harsh and croaking. Their dress is a girdle of fibrous bark. They also wear ornaments of bone or coral, and paint their breasts with wide black streaks. Their hair is crisp and woolly. Their skin is of a chocolate colour. They are mainly Papuan in character, and are grouped in tribes, each with its own chief. In the irrigation and tillage of the soil they show no small skill. Contact with the baser elements of civilized life has contributed much to their deterioration, and it is probable that they will soon become extinct. The chief crops of the island are maize and taro; and among the other objects of cultivation are rice, wheat, sugar-cane, coffee, cotton, coco-nuts, &c. The imports, largely for the convict stations, are wines and spirits, flour, vegetables, &c.; and the exports include nickel, preserved meat, chrome and other ores, &c. New Caledonia was taken possession of by the French on the 24th of September, 1853, and a small colony was formed there. During the time of the second empire it was employed as a place of banishment for criminals, a purpose which it still serves. In 1872, by a decree of the National Assembly at Versailles, New Caledonia was fixed upon as the place to which the condemned Communists should be transported. The number of the condemned amounted to more than 3000. The Communists, however, were not mixed with the ordinary criminals, but were stationed apart in the Isle of Pines, about 30 miles from the main island. In 1878 a native rising took place, during which much damage was done to life and property among the European settlers; and in order to suppress it a large number of the natives had to be killed and many more condemned to penal servitude. The dependencies of the island are the Isle of Pines, the Loyalty Islands, the Huon Islands, the Chesterfield Islands, and the Wallis Archipelago. The whole of this territory is under a governor, advised by a council-general, and is divided into five arrondissements, of which four are ruled by administrators, whilst the fifth, Nouméa, is directly under the governor. The convicts are grouped in five classes, of which two have contributed much to the improvement of the colony by the construction of roads, &c., whilst a third is virtually free. A railway now connects Nouméa with Kanala. The capital, and only important town, is Nouméa, formerly called Port-de-France, with a population of 6679. It lies in a small mountainous peninsula on an excellent bay of the same name. In 1876 the white population was 16,895, the free civil population being 3340, the military and their families, &c., amounting to 2445. In 1896 the total population was 51,033, of whom 8384 were European civilians, 1506 military, 10,757 penal, 3041 Asiatics, and 27,345 natives. The Catholic mission, which has numerous stations, has made many converts. The aborigines sometimes engage as labourers under the Europeans, and natives of the neighbouring islands are also introduced for the sake of their labour. The government of the island is essentially military, and the frequent escape of convicts (sometimes unwelcome visitors to Australia) has rendered the authorities very strict.

CALENDAR, a systematic division of time into years, months, weeks, and days, or a register of these or similar divisions. Among the old Romans, for want of such a register, it was the custom for the *pontifex maximus*, on the first day of the month, to proclaim (*calare*) the month, with the festivals occurring in it, and the time of new moon. Hence *calendæ* (the first of the month) and *calendar*. The periodical occurrence of certain natural phenomena gave rise to the first division of time. The apparent daily revolution of the starry heavens and the sun about the earth occasioned the division into days. The time at which a day begins and ends has been differently fixed: the reckoning being from sunrise to sunrise, from sunset to sunset, or from midnight to midnight. The day adopted for all civil purposes is the *mean solar day*, because the true solar day is a constantly varying quantity. The difference between the two days is, however, so slight as to be inappreciable to ordinary observation. The changes of the moon, which were observed to recur every twenty-nine or thirty days, suggested the division into months, but the month now used, though nearly equal to a lunation, is really an arbitrary unit; and as a still longer measure of time was found necessary for many purposes, it was supplied by the apparent yearly revolution of the sun round the earth in the ecliptic. The time of this revolution has been finally determined to be 365 days, five hours, forty-eight minutes, and fifty seconds, but as it has at various times been reckoned differently, this has given rise to corresponding changes in the calendar. This division of time is called a *solar year*. The division into weeks, which has been almost universally adopted, is not founded on any natural phenomenon, and as it originated in the East, it has been attributed to the divine command to Moses in regard to the observation of the seventh day as a day of rest. By other authorities it has been ascribed to the number of the principal planets, a theory supported by the names given to the days. It was not used by the Greeks, nor by the Romans till the time of Theodosius. The great influence of the sun's course upon the seasons has naturally attracted the attention of men at all periods to this phenomenon; accordingly all nations in any degree civilized have adopted the year as the largest measure of time. The year of the ancient Egyptians was based on the changes of the seasons alone, without reference to the lunar month, and contained 365 days, which were divided into twelve months of thirty days each, with five supplementary days at the end of the year. The Jewish year consisted of lunar months of which they reckoned twelve in the year, intercalating a thirteenth when necessary to maintain the correspondence of the particular months with the regular recurrence of the seasons. The Greeks in the earliest period also reckoned by lunar and intercalary months. They divided the month into three decades, a system also adopted long afterwards at the time of the French revolution. It possesses the advantage of making the smaller division an exact measure of the larger, and under it the number of a day in the ten-day period readily suggests its number in the month. The Greeks of the time of Solon had a year of twelve months alternately of twenty-nine and thirty days, the total number of days being thus 354, and the year being very nearly equal to a lunar one. Soon afterwards a month of thirty days began to be intercalated every other year in order to reconcile their year with that founded on the sun's movement, but as the error was still very large the intercalary month was afterwards omitted once in four times. The Jewish and also the Greek year thus both varied in duration according as the intercalary month was introduced or omitted. This with the uncertainty as to the exact duration of the year was a constant source of confusion.

Various plans for the reformation of the calendar were proposed from time to time; but all proved insufficient, till Meton and Euctemon finally succeeded in bringing it to a much greater degree of accuracy, by fixing on the period of nineteen years, in which time the new moons return upon the same days of the year as before (as nineteen solar years are very nearly equal to 235 lunations). (See CYCLE.) This mode of computation, first adopted by the Greeks about 432 B.C., was so much approved of that it was engraven with golden letters on a tablet at Athens. Hence the number, showing what year of the moon's cycle any given year is, is called the *golden number*. This period of nineteen years was found, however, to be about six hours too long. This defect Calippus, about 102 years later, endeavoured to remedy, but still failed to make the beginning of the seasons return on the same fixed day of the year.

The Romans at first divided the year into ten months, but they early adopted the Greek method of lunar and intercalary months, making the lunar year consist of 354, and afterwards of 355 days, leaving ten or eleven days and a fraction to be supplied by the intercalary division. This arrangement, which was placed under the charge of the pontiffs, continued till the time of Cæsar. The first day of the month was called the *calends*. In March, May, July, and October the 15th, in other months the 13th, was called the *ides*. The ninth day before the ides (reckoning inclusive) was called the *nones*. The other days of the month they reckoned forward to the next calends, nones, or ides, whether in the same or the succeeding month, always including both days in the reckoning. Thus the 3d of March, according to the Roman reckoning, would be the fifth day before the nones, which in that month fall upon the 7th. The 8th of Jan., in which month the nones happen on the 5th, and the ides on the 13th, was called the 6th before the ides of January. Finally, to express any of the days after the ides, they reckoned in a similar manner from the calends of the following month. From the inaccuracy of the Roman method of reckoning, it appears that in Cicero's time the calendar brought the vernal equinox almost two months later than it ought to be. To check this irregularity Julius Cæsar invited the Greek astronomer Sosigenes to Rome, who, with the assistance of Marcus Fabius, invented that mode of reckoning which, after him who introduced it into use, has been called the *Julian calendar*. The chief improvement consisted in restoring the equinox to its proper place in March. For this purpose two months were inserted between November and December, so that the year 707 (B.C. 46), called from this circumstance the *year of confusion*, contained fourteen months. In the number of days the Greek computation was adopted, which made it 365¼. The number and names of the months were kept unaltered, with the exception of Quintilis, which was henceforth called in honour of the author of the improvement *Julius*. To dispose of the quarter of a day it was determined to intercalate a day every fourth year between the 23d and 24th of February. This was called an *intercalary* day, and the year in which it took place was called an *intercalary* year, or, as we term it, a *leap* year.

This calendar continued in use among the Romans until the fall of the empire, and throughout Christendom till 1582. The festivals of the Christian Church were determined by it. With regard to Easter, however, it was necessary to have reference to the course of the moon. The Jews celebrated Easter (that is, the Passover) on the 14th of the month Nisan (or March); the Christians in the same month, but always on a Sunday. Now, as the Easter of the Christians sometimes coincided with the Passover of the Jews, and it was thought unchristian to celebrate so important a festival at the same time as the Jews did, it was resolved at the Council of Nice, 325 A.D., that from that time Easter should be solemnized on the Sunday following the first full moon after the vernal equinox, which was then supposed to take place on the 21st of March. As the course of the moon was thus made the foundation for determining the time of Easter, the lunar cycle of Meton was taken for this purpose; according to which the year contains 365¼ days, and the new moons, after a period of nineteen years, return on the same days as before. The inaccuracy of this combination of the Julian year and the lunar cycle, must have soon discovered itself on a comparison with the true time of the commencement of the equinoxes, since the received length of 365¼ days exceeds the true by about eleven minutes; so that, for every such Julian year, the equinox receded eleven minutes, or a day in about 130 years. In consequence of this, in the sixteenth century, the vernal equinox had changed its place in the calendar from the 21st to the 10th; that is, it really took place on the 10th instead of the 21st, on which it was placed in the calendar.

Luigi Lilio Ghiraldi, frequently called Aloysius Lilius, a physician of Verona, projected a plan for amending the calendar, which, after his death, was presented by his brother to Pope Gregory XIII. To carry it into execution, the pope assembled a number of prelates and learned men. In 1577 the proposed change was adopted by all the Catholic princes; and in 1582 Gregory issued a brief abolishing the Julian calendar in all Catholic countries, and introducing in its stead the one now in use, under the name of the *Gregorian* or *reformed calendar*, or the *new style*, as the other was now called the *old style*. The amendment ordered was this, ten days were to be dropped after the 4th of October, 1582, and the 15th was reckoned immediately after the 4th. Every hundredth year, which by the old style was to have been a leap year, was now to be a common year, the fourth excepted; that is, 1600 was to remain a leap year, but 1700, 1800, 1900 to be of the common length, and 2000 a leap year again. In this calendar the length of the solar year was taken to be 365 days, five hours, forty-nine minutes, and twelve seconds, the difference between which and subsequent observations is immaterial. In Spain, Portugal, and the greater part of Italy, the amendment was introduced according to the pope's instructions. In France the ten days were dropped in December, the 10th being called the 20th. In Catholic Switzerland, Germany, and the Netherlands the change was introduced in the following year, in Poland in 1586, in Hungary 1587. Protestant Germany, Holland, and Denmark accepted it in 1700, and Switzerland in 1701. In the German Empire a difference still remained for a considerable time as to the period for observing Easter. In England the Gregorian calendar was adopted in 1752, in accordance with an act of Parliament passed the previous year, the day after the 2d of September becoming the 14th. Sweden followed in 1753. The change adopted in the English calendar in 1752 embraced another point. There had been previous to this time various periods fixed for the commencement of the year in various countries of Europe. In France, from the time of Charles IX., the year was reckoned to begin from the 1st of January; this was also the popular reckoning in England, but the legal and ecclesiastical year began on 25th March. The 1st of

January was now adopted as the beginning of the legal year, and it was customary for some time to give two dates for the period intervening between 1st January and 25th March, that of the old and that of the new year, as January 175$\frac{2}{3}$. Russia alone retains the old style, which now differs twelve days from the new.

In France, during the revolutionary epoch, a new calendar was introduced by a decree of the National Convention, Nov. 24, 1793. The new reckoning was to begin with 22nd September, 1792, the day on which the first decree of the new republic had been promulgated. The year was made to consist of twelve months of thirty days each, and, to complete the full number, five *fête* days (in leap years six) were added at the end of the year. Instead of weeks, each month was divided into three parts called *decades*, consisting of ten days each; the other divisions being also accommodated to the decimal system. The names of the months were so chosen as to indicate, by their etymology, the time of year to which they belonged. They were as follows:—Autumn, from the 22nd Sept. to the 22nd Dec.: *Vendémiaire*, vintage month (Oct.); *Brumaire*, foggy month (Nov.); *Frimaire*, sleet month (Dec.). Winter, from 22nd Dec. to 22nd March: *Nivôse*, snowy month (Jan.); *Pluviôse*, rainy month (Feb.); *Ventôse*, windy month (March). Spring, from 22nd March to 22nd June: *Germinal*, bud month (April); *Floréal*, flower month (May); *Prairial*, meadow month (June). Summer, from 22nd June to 22nd Sept.: *Messidor*, harvest month (July); *Thermidor*, hot month (August); *Fructidor*, fruit month (Sept.). The ten days of each decade were called (1) *Primidi*, (2) *Duodi*, (3) *Tridi* (4) *Quartidi*, (5) *Quintidi* (6) *Sextidi*, (7) *Septidi*, (8) *Octidi*, (9) *Nonidi*, (10) *Decadi* (the Sabbath). This calendar was abolished at the command of Napoleon, by a decree of the senate, 9th Sept. 1805, and the common or Gregorian calendar re-established on the 1st of January of the following year. Of calendars projected since then we may mention that put forward by Auguste Comte in 1849, by which a separate name is given to every day in the year, while the months and weeks have also particular names, all arranged upon a principle of hero-worship. Moses, Homer, Aristotle, Shakspere, Descartes, Cæsar, St. Paul, &c., are honoured with months, while minor individuals, such as Ulysses, Romulus, Socrates, and Plato have days assigned to them. See also Epoch, Chronology.

CALENDER, an apparatus or machine consisting of cylinders or rollers, often heated, by means of which different fabrics are subjected to great pressure, the object being to make them smooth and glossy, to glaze them, to water them, or give them a wavy appearance, and thus fit them for the market.

CALENDERS, a sect of dervishes in Turkey, Persia, &c. They are not very strict in their morals, nor in very high esteem among the Mohammedans. They preach in the market-places, and live upon alms. See Dervish.

CALENDS, with the Romans, the name given to the first day of each month, used in fixing dates as explained in the article Calendar. The Greeks did not make use of calends in reckoning, whence the Roman proverbial expression *ad Græcas calendas* (on the Greek calends), meaning *never*. The calends of January were more solemn than the others.

CALENTURE, a kind of feverish delirium, said to be incident to persons in hot climates, and especially to attack them on board ships. It is said that the patient imagines the sea to be a green field, in which he is tempted to walk by the coolness and freshness of its appearance. But we do not in these days hear of persons being afflicted in such a manner.

CALHOUN, John Caldwell, an eminent American statesman, born at Abbeville, South Carolina, March 18, 1782; died at Washington, March 31, 1850. He studied at Yale College and Litchfield, was admitted to the bar in his native state in 1807, and in 1811 was sent to Congress, where he distinguished himself by his eloquence, and became the leader of the party in favour of a war with England. In 1817 he was made secretary of war under President Monroe, and effected a considerable reduction in the expenditure on the army. In 1825 he was elected vice-president of the United States, under John Q. Adams as president, and then under General Jackson, but on a tariff unfavourable to the Southern states being passed, he went into opposition, and resigned his vice-presidency (1832). Holding a doctrine of extreme states rights, he got a resolution passed in the legislature of South Carolina, 'That any state in the Union might annul an act of the Federal government'. To this resolution several other states gave in their adhesion, and a dissolution of the Union was threatened. In 1832 Calhoun was elected to the senate, but left it in 1843, and next year became secretary of state. He re-entered the senate in 1845, and continued till his death an advocate of state rights, and of the policy of the slave-holding states. His works were published after his death, in 1853-54 (six vols.). In one of them, called the Philosophy of Government, he vindicates his doctrine of state sovereignty.

CALIBRE, the interior diameter of the bore of any piece of ordnance. The calibre of a gun is usually measured by a scale of inches.

CALICO-PRINTING is the art of producing on calico or cotton cloth variegated patterns by the process of printing, the object as a rule being to have the colours composing the designs as fast as possible to washing and other influences. It is similar to the art of dyeing, but differs from it in so far that the colouring matters are fixed on certain parts of the fabric only, to form a pattern. Linen, wool, and silk fabrics are printed in a similar manner, but less extensively. The origin of the art of printing is probably coeval with that of dyeing, for a brief historical sketch of which see the article Dyeing. India is generally regarded as the birthplace of calico-printing, and the word *calico* is derived from the name of the Indian town Calicut, where it was at one time extensively manufactured and printed. Calico-printing, as an Egyptian art, was first described by Pliny in the first century. Indian-printed chintz calicoes were introduced into Europe by the Dutch East India Company, and the first attempts at imitating them in Europe are said to have been made in Holland, but at what exact date is uncertain. The art, however, soon spread to Germany and England, where it is said to have been introduced about 1676, two of the earliest works being situated at Richmond, on the Thames, and at Bromley Hall, Essex. In 1738 calico printworks were established in Scotland in the neighbourhood of Glasgow, and in 1764 at Bamber Bridge, near Preston, in Lancashire. At the present time the chief seats of the calico-printing trade in Britain are still in the neighbourhood of Glasgow and Manchester. Abroad, the chief seat of calico-printing is Mulhausen (Alsace), Germany, and it is practised in various towns in France, Austria, Russia, Switzerland, Holland, and the United States.

Calico-printing is of a highly complex character, and enlists not only the co-operation of the arts of designing, engraving, bleaching, and dyeing, but also, as an important element of success, the science of chemistry.

The first operation to which the gray calico, as it comes from the loom, is submitted is that of *singeing*. This consists in burning off the loose downy fibres from the surface by passing the pieces rapidly, in an open and stretched condition, over red-hot plates or a row of smokeless Bunsen gas-flames. The object of singeing is to obtain a smooth printing-surface on the calico, thus ensuring the production of clear, sharp impressions during the printing process. The next operation is that of *bleaching*, which consists in boiling the fabric with weak alkaline solutions, followed by a treatment with cold dilute solutions of bleaching-powder and acid, interspersed with frequent washings with water. By these means the natural impurities of the cotton are removed and the calico ultimately presents a snow-white appearance. A number of pieces are now stitched together, wrapped on a wooden roller, and passed through a so-called shearing machine, in which, by means of a spiral cutter, similar to that in a lawn-mower, any projecting knots, loose fibres, or down are finally removed. In this condition the calico is ready for the printer.

The *printing* of the patterns upon the cloth may be carried out in various ways, the earliest method being by means of wooden blocks on which the figures of the patterns stand out in relief. Where several colours are employed in one pattern, a block for each colour is necessary. In a set of blocks for one pattern each block, although at first having the same design drawn upon it, is cut in such a manner that it ultimately transfers only a single colour, which appears in different parts of the pattern. When all the blocks have been applied, the various colours printed complete the original design. To ensure accurate juxtaposition of the colours each block is furnished with brass points at the corners in order to guide the workman. The printer first furnishes the face of the block with the requisite colour by pressing it several times on a piece of woollen cloth suitably stretched and supported on a so-called *colour-sieve*, and which has been previously brushed over with colour by a boy attendant. The printer then applies the block to the surface of the calico, which is stretched on a long table covered with felt, striking the back of the block with his hand or with a small mallet. The operation of block-printing is slow and tedious, and although many improvements have been introduced, and it can even be effected by mechanical power, as in the so-called Perrotine machine, it is now only employed to a very limited extent for certain special kinds of work. Another mode of printing, introduced about 1760, is by means of engraved copper-plates, but its employment is also similarly restricted.

The modern method of printing, which dates from 1785, is effected by means of engraved copper cylinders, and this method has now practically superseded all others.

The method of *engraving* employed varies according to the kind of pattern to be put on the roller. In the case of very large patterns the figures are engraved by hand on the cylinders themselves with the use of the ordinary tools of the copper-plate engraver. For smaller designs, however, which are often repeated, it is usual in the first instance to engrave the pattern by hand on a very small cylinder of soft steel in *intaglio*, just as it will ultimately appear on the copper. This steel cylinder, which is called a *die*, is then tempered to a high degree of hardness, and by means of machinery is pressed against another cylinder of soft steel, on which the pattern is thus made to appear in *relief*. This last cylinder, called the *mill*, is then hardened, and being pressed against the copper cylinder the figures are indented, and the roller is ready for use. In the first instance the original pattern of the designer has always to be reduced or enlarged, so as to repeat an exact number of times over the roller to be engraved. In order to reduce the amount of skilled labour one repeat only of the pattern is engraved on the die; the mill, which is of larger diameter, has two, three, or four repeats; while the number of repeats on the circumference of the copper cylinder is still greater. A third method of engraving, which has now largely superseded the foregoing, is that of *etching*, in conjunction with the pentagraph or pantograph system of transferring the design to the copper roller. The roller, being coated uniformly with a bituminous varnish, has the pattern traced on the varnish in the pentagraph machine by a set of diamond points, and it is then submitted for a very brief period to the action of nitric acid. In the parts where the pattern has been traced the varnish is removed, there the copper is speedily attacked by the acid, and the pattern is thus etched upon it. After removing the varnish the roller is ready for printing.

The *cylinder printing-machine* consists of a large central iron drum, around which are arranged one or more engraved copper rollers, according to the number of colours to be printed simultaneously. Each roller is provided with the means of making several adjustments, in order to determine the exact position of the colour which it prints. The central drum is wrapped with cloth, and it is further provided with an endless blanket and back-cloth, so as to present a yielding surface to the printing rollers. The cloth to be printed passes from a roll behind the machine, round the central drum, in a tightly-stretched condition, while the several printing rollers press forcibly against it. Each roller as it revolves is fed with colour from a small trough below, the superfluous colour being scraped off the plain surface of the roller by means of a sharp-edged steel blade, or 'doctor', thus leaving the colour only in the engraved portions. As the rollers thus charged with colour press against the cloth the latter absorbs or withdraws the colour from the engraving, and the pattern is thus transferred to the calico. By this machine as much work can be performed in three minutes as could be done by block-printing in six hours. After the cloth has received the impression from the rollers it passes over a series of steam-heated flat iron chests, or cylinders, and is thus dried.

In close connection with the printing-machine department is the so-called *colour-house* or colour-shop, where the solutions of colouring matters are suitably thickened and made ready for the printer. The colour-house is provided with numerous steam-heated copper pans, so arranged on supports that they can be readily turned over for emptying or cleaning. The colour-mixtures are stirred with wooden blades by hand, or by mechanical agitators, and carefully strained through cloth before use. The thickening of the colour solutions with starch, flour, gum, dextrin, albumen, &c., is necessary to prevent the spreading of the colour by capillary attraction beyond the printed parts, and thus ensure sharp and neat impressions. Near the colour-house is a well-appointed *chemical laboratory*, and a drug-room containing the store of colouring matters, dyewood-extracts, thickenings, chemicals, &c.

The various classes or styles of calico-prints are usually arranged either according to the chief dye-stuffs employed or their mode of application. Each of these primary styles may be further separated into subdivisions, of which the most important are the *discharge* and *resist styles*, which refer to the manner in which the pattern is produced. The following include the chief *styles of calico-prints* at present in vogue:—

Madder Style.—This is so named because the chief dye-stuff formerly employed in it was madder. This dye-stuff belongs to the class of so-called *mordant-colours* described in the article DYEING, to which the reader is referred. Such dye-stuffs are worthless if employed alone by the calico-printer, and only furnish useful colours if applied in conjunction with certain metallic salts or *mordants*, of which the chief ones here employed are the acetates of aluminium and iron. At first the pattern is printed on the white calico with these or similar mordants alone, and only after they have been suitably fixed is the madder or other similar colouring matter applied in the dye-bath, where for the first time the desired coloured pattern appears. The aluminium mordant yields red or pink, iron yields purple or black, a mixture of iron and aluminium yields chocolate, &c. The fixing of the mordant after printing and drying is effected by passing the printed calico through the so-called *ageing-machine*, a large chamber suitably heated and charged with moisture, where the acetic acid of the printed mordants is driven off, leaving the aluminium salt in an insoluble form on the calico. A more complete fixing of the mordant is subsequently effected by passing the fabric through solutions containing silicate or arseniate of soda, and a final washing completes its preparation for dyeing. The dyeing operation consists in boiling the fabric in a solution or decoction of the requisite dye-stuff. After dyeing, the stained unprinted portions are cleansed and purified, while the printed colours are rendered more brilliant by washing, soaping, chloring, &c. Variety of effect is produced by printing the same fabric two or three times with various designs (*print, cover, pad*) before proceeding to the ageing, &c. If in the first instance a portion of the pattern is printed with lime-juice (citric acid), it resists or prevents the fixing of the mordants applied over it in the second and third printings, and the part remains undyed and appears as a so-called *resist-white*. In a similar manner stannous chloride, mixed with aluminium acetate before printing, resists the fixing of iron mordants printed over the aluminium mordant, and a *resist-red* pattern under a purple *cover* is obtained, presuming madder to be the dye-stuff employed. Alizarin now replaces the madder formerly used, and similar variegated effects are obtained if other mordant dye-stuffs are employed, *e.g.* cochineal, quercitron bark, &c. Formerly a preparation of madder termed garancine was largely employed, and gave rise to the *Garancine Style*, in which the colours were fuller and darker, the prevailing hues being browns, chocolates, drabs, &c. Since the range of colours yielded in the madder style is limited, additional colours, *e.g.* green, blue, yellow, may be printed in by block after dyeing, &c., and are fixed by steaming. If the whole fabric is evenly impregnated with mordant by means of a 'padding-machine' and dried, and then a pattern is printed over the mordant with lime-juice, the mordant is removed or discharged in the printed parts, and remains white in the subsequent dyeing. Such a print would be termed a *Padded Style* with *discharge-white*.

Steam Style.—Many colouring matters, differing from each other widely in character, are fixed by the operation of steaming instead of by dyeing, so that this style is somewhat varied in character. Ordinary steam-colours consist of a thickened mixture of dyewood-extract and mordant, with the addition of assistant metallic salts and acids. The mixture is printed upon the white calico, which, after drying, is exposed from a half to one hour in closed chambers to the action of steam. This steaming operation effects the combination of the colouring matter and mordant, and the colour is thus developed and at the same time fixed upon the calico. Black is produced with logwood-extract and chromium acetate, scarlet is produced with cochineal-extract and stannous chloride. The prints are washed and dried after steaming, the colours being usually bright, but not very fast. Steam-colours, fast to light and soap, are obtained in a similar manner by printing mixtures of alizarin and allied colouring matters with mordants, and then steaming. These are used in the so-called *Madder Extract* or *Steam Alizarin Style*, in which red, pink, purple, &c., appear. In the *Pigment Style* use is made of pigments, *i.e.* insoluble coloured mineral powders, *e.g.* ultramarine blue, chrome yellow, Guignet's green, &c. These are mixed with a solution of egg or blood albumen, printed, and steamed. The albumen coagulates on steaming, and thus adheres firmly to the cloth, at the same time inclosing the pigments within the coagulum. Such colours are fast to light and soap, and may therefore be printed simultaneously with the steam-alizarin-colours for the production of variegated fast prints. Another class of colours are the so-called basic-colours, *e.g.* magenta, aniline blue, &c. Their solutions may also be thickened with albumen, printed, and steamed, to give fast steam-colours. It is more usual, however, to print a mixture of the thickened colour solution and tannic acid, and to pass the steamed print through a boiling solution of tartar-emetic. By this means an insoluble colour-lake (tannate of antimony and colour-base) is fixed on the calico, which is fast to soaping, but not to light. Basic-colours applied in this manner are now very usually printed along with the steam-alizarin-colours, instead of pigments thickened with albumen, and variegated fast prints are thus obtained. Loose pigment colours are basic-colours thickened with starch or gum tragacanth only, and then steamed. Such prints do not even stand washing with cold water.

Turkey-red Style.—In this style use is made of the fact that Turkey-red is at once bleached by the action of chlorine. Plain dyed Turkey-red calico is printed with tartaric acid, dried, and passed through a solution of bleaching-powder. In the printed parts chlorine gas is evolved, the red is destroyed, and a *white-discharge* pattern is produced. A blue pattern results if Prussian-blue is added to the printing mixture; yellow is obtained if a lead salt is added, and the fabric is afterwards passed through bichromate of potash solution, whereby yellow chromate of lead is produced; green results from a mixture of the blue and yellow; black is printed direct. These and other discharge-colours may also be obtained by other methods.

Indigo Style.—Of the numerous indigo styles in use it is only possible to refer to one or two of the most important. Indigo-blue patterns on a white ground are obtained by printing a thickened mixture of finely-ground indigo and caustic soda on white calico previously impregnated with glucose. A subsequent steaming reduces the indigo to indigo-white, and causes it to penetrate the fibre, while a final washing oxidizes, regenerates, and fixes the colour. A *resist-white* pattern on a blue ground is obtained by first printing upon the white calico a resist-paste composed of gum or flour, China-clay, sulphate of copper, &c. When the printed calico is dyed in the indigo-vat the paste resists the entrance of the colour, partly in a mechanical and partly in a chemical manner, hence the blue is only fixed in those parts which are unprotected by the paste, after the removal of which by washing the white pattern appears. Various resist-colours, *e.g.* yellow, green, &c., are obtained by the addition of different chemicals to the paste and altering the after-processes. A *discharge-white* pattern on a blue ground is obtained by printing on plain indigo-blue-dyed calico a solution of bichromate of potash thickened with gum, and then passing the fabric through a solution containing sulphuric and oxalic acids. During this passage there is liberated, in the printed parts only, chromic acid, which at once oxidizes and destroys the blue, producing the desired white pattern. *Coloured-discharge* patterns are produced in a similar manner by employing albumen- instead of gum-thickening, and adding to the printing mixture such pigments as are not affected by acid, *e.g.* vermilion, chrome yellow, Guignet's green, &c.

Bronze Style.—Manganese brown or bronze is decolourized by reducing agents, hence *white-discharge* patterns on a bronze ground are obtained by printing plain manganese-brown-dyed calico with a mixture of stannous chloride and oxalic acid, and then steaming. *Coloured-discharge* patterns are obtained if colouring matters are added to the printing mixture which are not affected by reducing agents, or which even require stannous chloride as a mordant to develop the colour, *e.g.* Prussian-blue, chrome yellow, Persian-berry yellow, Brazil-wood pink, safranine, acridine orange, &c.

Aniline Black Style.—Aniline black being a product of the oxidation of aniline, patterns in this colour on a white ground are obtained by printing a thickened solution of aniline hydrochloride containing the oxidizing agent, sodium chlorate, and a salt of copper or vanadium. When the printed fabric is slightly steamed or exposed to a moist, warm atmosphere, the impression, which is at first devoid of colour, gradually becomes dark-green, and this by a final treatment with an alkaline solution, soap, &c., changes at once to a rich black. The colour is extremely fast to light, alkalis, acids, &c., and it is largely employed by the printer, both alone and in conjunction with dyed or steam colours. The development of the black during the ageing or oxidizing process only occurs in the presence of a mineral acid, hence *resist-whites* are obtained by first printing the design on the white calico with thickened solutions of substances of an alkaline or reducing character, or salts of organic acids, *e.g.* acetate of soda, and then printing or padding over all with the aniline-black mixture, ageing, steaming, &c. Where the design is printed the alkalinity entirely prevents the development of the black. Pigment colours thickened with albumen, also certain benzidine colours, *e.g.* chloramine orange, &c., containing an admixture of chalk, acetate of soda, &c., are largely employed in this manner. These *resist-colours* may also be printed immediately after the application of the aniline-black mixture, before the development of the colour by ageing.

Azo Colour Style.—As explained in the article DYEING, the so-called insoluble-azo-colours result from the interaction of an azo compound and a phenol. Two methods of printing based upon this principle are employed. One method is to print the design with a thickened solution of β-naphthol on the white calico, and then pass the fabric through a very cold solution of the azo compound (*developing-bath*), when the design at once appears in a colour corresponding to the azo compound employed. Another method is to print the design with a thickened solution of the azo compound upon calico which has been previously impregnated with a solution of sodium-naphthol and dried; in this case the colour of the design is developed in the moment of impression. The necessary azo compounds are obtained by the action of nitrous acid on salts of amido substances, *e.g.* paranitraniline, naphthylamine, nitrotoluidine, dianisidine, &c., each of which yields a distinct colour, bright-red, claret-red, orange, blue, &c. The naphthol-prepared cloth and also the azo compounds are somewhat unstable, so that this style is not successfully printed without considerable care and attention. The insoluble-azo-colours, also the direct-colours or benzidine colours (see DYEING), are capable of furnishing discharge-patterns, since, in common with the azo colours generally, they are readily decomposed and destroyed under the influence of reducing agents. It suffices to print calico dyed with these colours, *e.g.* benzopurpurine, chrysophenine, benzoazurine, Mikado brown, &c., with a mixture containing stannous acetate, zinc powder, or other similar reducing agent, and then steam the printed fabric, to obtain *white-discharge* patterns. If there be added to the printing mixture such mordants and colouring matters as are not affected by reducing agents, *e.g.* safranine, auramine, &c., a variety of *coloured-discharges* are obtained, exactly as in the Bronze Style. Many of the benzidine colours may also be printed direct on white calico to furnish coloured designs, but the prints obtained in this manner are not particularly fast to washing.

The infinite variety of patterns and colour combinations, as well as the numerous methods of their production and the enormous amount of detail connected therewith, render it impossible to give within the limits of this article even an approximation to a detailed account of the art of the calico-printer, which can certainly be regarded as one of the most ingenious, interesting, and beautiful of the industrial arts.

CALICUT, a seaport of India, presidency of Madras, on the Malabar coast, 6 miles north of Beypur, in the midst of extensive palm groves. It is an important place, with various public offices and institutions, including court-house, custom-house, lunatic asylum, Anglican, Lutheran, and Roman Catholic missions, municipal and other schools, barracks, lighthouse, &c. The town dates from the thirteenth century, and was the first port in India visited by Europeans. It was from the name of this place that the word *calico* was derived. Vasco da Gama visited it in 1498, and in 1510 Albuquerque wrecked the town. In 1766 Calicut was taken by Hyder Ali, and in 1790 it fell into the hands of the British. Cardamoms, teak, sandalwood, pepper, and wax are the principal exports. Pop. in 1891, 66,078; in 1901, 75,510.

CALIF and CALIFATE. See CALIPH.

CALIFORNIA, one of the United States of America, on the Pacific coast, and bounded on the land side by Oregon, Nevada, Arizona, and Mexico (here the territory of Lower California); area, 155,980 square miles. The coast is generally rugged and precipitous, and presents few good harbours for its extent, which is above 9° of lat. On the S. part of the coast are a few islands. California is naturally divided into two districts of unequal size and of markedly different character, by the Sierra Nevada, a ridge of mountains which forms the eastern limit of the northern portion of the country, but in the south traverses it almost centrally. The western district consists of one great and several smaller valleys, all nearly parallel to the coast and to each other, with many minor transverse valleys formed by spurs of the chief mountain ranges. It is bounded on the E. throughout by the Sierra Nevada, or snowy range, which, proceeding from Oregon, takes a direction generally southward, though somewhat tortuous, parallel to, and about 150 miles from the coast, and unites in lat. 34° 30′ N. with a lower and nearly parallel range to the W., called the Coast Range, both afterwards constituting one chain which, running farther south, forms the peninsula of Old California. The whole south-eastern portion of the state is arid and barren, here being situated the Mohave Desert, Death Valley, and the Colorado Desert. The general height of the Sierra Nevada range varies from 7000 to 11,000 feet. The highest portion lies between 35° 30′ and 38°, Mount Whitney being 14,898 feet. Active volcanic agencies have at one time been at work in this district. Mount Shasta and other peaks are extinct volcanoes, containing numerous craters. The lava in the neighbourhood of Shasta covers an area of 10,000 square miles, and is estimated to be 10,000 feet deep. The formation of the district, to a considerable extent, is granitic, though trap and other igneous rocks occupy much of the upper and lower valley of the Sacramento, as well as a large extent of all the N. part of the country. The Coast Range—a comparatively low ridge of heights, but containing several peaks of considerable elevation—originates near the Oregon frontier, takes a southerly direction, parallel to, and at an average distance of 50 miles W. from the Sierra Nevada, with which it unites, as above noted, in lat. 34° 30′ N.; it is formed chiefly of cretaceous rocks, which contain coal, quicksilver, and other minerals. Between these two ranges lies the great valley of the Sacramento, and that of the San Joaquin, together 500 miles long. West of the Coast Range are other lower ranges of hills, also generally parallel to the coast, forming valleys, each named from the stream which waters it. The N. part of the great valley between the two principal ranges is watered by the Sacramento, which flows S. through a course of upwards of 300 miles, receiving numerous affluents from the Sierra Nevada, and near the centre of the state, along with the San Joaquin, falls into Suisun Bay, an arm of that of San Francisco. It varies in width from 200 to 300 yards, and is navigable for about 150 miles. Its principal tributaries are the American, Feather (which receives the Yuba and Bear), Butte, Pit, and other rivers. The S. part of the valley is watered by the San Joaquin, which rises in the Sierra Nevada, flows N. for about 250 miles, and along with the Sacramento falls into Suisun Bay, as already stated. It is navigable for 100 miles. From the head of the valley it receives the waters of the Tulare swamp, and like the Sacramento, numerous tributaries; all the chief affluents of both rivers descending from the Sierra Nevada. Its principal affluents, some of which are also navigable to a certain extent, are the Merced, navigable for 20 miles, with the famous Yosemite Valley on its upper course, Tuolumnes, Stanislaus, Calaveras, Mokelumnes, and Cosemnes. The Klamath flows from Oregon through the N.W. corner of the state, and the Buenaventura, flowing N. through a valley W. of the coast range, falls into Monterey Bay. The principal lakes are Tulare, Tahoe, Honey, Goose, and Clear Lake. The Bay of San Francisco, forming the most capacious harbour on the Pacific coast, is divided into two arms —San Pablo and its continuation Suisun Bay, and the Bay of San Francisco proper. Altogether it is about 60 miles in length, 14 broad, and with a coast-line of 275 miles. It is connected with the ocean by a strait about 2 miles wide, and from 5 to 7 long, breaking through a range of low mountains, and called the Golden Gate. The city of San Francisco stands on the N.W. shore of the southern arm. The northern arm, San Pablo, is united by the Strait of Carquines with Suisun Bay. Other bays are Humboldt, Monterey, De los Esteros, San Pedro and San Diego.

Gold, and other Minerals.—Archæan rocks constitute the bulk of the Sierra Nevada, but in many places volcanic rocks protrude, and along the western slopes the formations are Jurassic. The Coast Range is mainly cretaceous, and in the valley there are extensive formations of more recent date. The minerals of the state are of great importance. Copper is found in many parts of the state, and the ore is frequently rich, but except in one or two districts the expenses of management have hitherto prevented it from being worked extensively. The quicksilver mines of New Almaden, Napa, Mirabel, and elsewhere produce nearly all of this metal found in the United States. Lead, tin, antimony, and cobalt are found, as well as other minerals, which are not yet extensively worked. Coal is found in most of the coast counties, but is not of first-rate quality, and the extent of the coal-fields has not yet been determined. Sulphur is abundant, marble of a variety of grains, and precious stones, including opals and diamonds, sandstone, and granite are to be met with. Silver is usually found along with gold, and there are separate veins, but they have not yet proved very profitable. Salt is largely manufactured from sea-water; and petroleum is abundantly produced in Los Angeles, Santa Barbara, and Ventura counties. Gold, however, is so plentiful, that less attention has been paid to baser minerals. The gold is found in various slates containing veins of quartz, and in hypogene or primary rocks, that have been protruded through them, in the Sierra Nevada, both N. and S. of the junction of the Coast Range, and in the alluvial deposits of the rivers. The earliest discoveries were naturally confined to the placer gold, as the latter is called. The mining methods were at first very simple, but gradually more efficient machinery was introduced. The first source, however, above indicated—the living rock—must be the permanent source of supply; for it is in the nature of auriferous alluvial deposits to be ultimately exhausted—a fact of which plenty of evidence is afforded by the gold-washings of Brazil and other countries. Alluvial deposits are found in the great valley along the rivers Sacramento, Joaquin, and their affluents from the Sierra Nevada; on the river Klamath and its tributaries, and probably on many others. They consist of silt, clay, and gravel or shingle; the last often containing numerous large stones, rendering the labour of removing them to get at the clay and small detritus very great. The most important deposits are in the Sierra Nevada, from Mariposa to Downieville. Rich deposits are also found near Shasta, Weaverville, and Yreka. On the coast mountains gold has been found at various points, but the yield has not been large. The metal is found in the form of dust, or of small grains, in smaller quantity in the surface deposits on the banks, or in the beds of the streams; and in greater abundance in the lower and firmer deposits, and in greatest abundance (at least on the San Joaquin) next the slate on which these deposits frequently rest; the gold, from its weight, apparently always seeking the lowest stratum. The metal is obtained by washing the alluvium, till all the earthy matter is floated off, when the gold is found left at the bottom of the vessel. New discoveries of gold still continue to be made, but not so rapidly as the old supplies are exhausted. In the period between 1848 and 1892, gold to the value of about £260,000,000 was obtained; the maximum production, that in 1853, amounted to £13,000,000. In 1897 gold to the value of £3,766,000 was obtained.

Climate.—As is natural in a country of such extent and so diversified, California possesses several varieties of climate. Generally speaking, it may be esteemed genial and mild; and the year may be divided into a dry and a more or less wet season—there being scarcely any frost, and rarely snow, excepting on the mountains. The rain falls mostly from December to May, and the north is wetter than the south. Near the coast fogs often prevail from May to September, and keep the summer cool, but south of 35° fogs are rare on the coast, and the summer heat is great. At Sacramento the temperature in summer sometimes reaches 110°, and in the rainy season it seldom falls below 40°. At San Francisco, on the other hand, only a few days in summer are uncomfortably warm. The heat in the valleys is frequently oppressive, not being tempered by the sea-breezes; and in the Colorado Desert the heat is intense. On the slopes of the Sierra Nevada much snow and rain are experienced at times, the summers being cool, and the winters often severe. Los Angeles, San Diego, and some others places are recommended for consumptives.

Zoology and Botany.—Among the mammals are the grizzly, the black, and the brown bear, skunk, badger, racoon, marten, cougar, jaguar, lynx, mountain cats, gray wolves, coyotes, several kinds of fox, the elk and other species of deer, the big-horn, 16 species of bats, and some 50 rodents, including the prairie-squirrel. The seal, sea-lion, sea-elephant, and sea-otter are found in the sea; the otter, beaver, and mink in the streams. The birds comprise about 350 species. Among other birds are the turkey, quail, and partridge; the Californian quail and partridge being beautiful birds. Salmon are numerous in the rivers. Snakes, among which is the rattlesnake, and lizards of various kinds are met with. There are over 100 species of forest trees, of which forty are evergreen. We may mention the white oak, the evergreen oak, cypresses, cedars, and lofty pines, among which the *Pinus Lambertiana* (red-wood) attains a height of upwards of 200 feet. This is surpassed by the *Sequoia gigantea*, the famous mammoth-tree of California, restricted to the western slope of the Sierra. Flowers are abundant, beautiful, and fragrant, and there are various nutritious grasses.

Agriculture, Commerce, &c. — From the uncertainty of the rains, and the great droughts of summer, agriculture must always, in California, depend much upon irrigation. Great irrigation canals have already been constructed, and large schemes for the general irrigation of the great valleys are contemplated. Wheat is by far the most important cereal cultivated in California, and the yield gives a large quantity both of grain and flour for export, much of this being carried to Britain. Tobacco, hops, and flax are grown, but not very largely. The cultivation of semi-tropical fruits has been carried to a great extent, and the orange groves and vineyards of California are famous. Indeed, the fruits are most varied, including apples, pears, plums, figs, oranges, lemons, peaches, apricots, olives, almonds, &c. Immense quantities of fruit are exported from the state. The production of wine is now often more than 30,000,000 gallons annually, besides brandy. Cattle, horses, and mules are bred. Immense flocks of sheep are reared, and much wool is exported.

The extensive export trade by sea, consisting chiefly in wheat and flour, wool, tinned fruits, tinned salmon, wine, &c., is carried on almost exclusively at San Francisco. Wheat and flour are annually exported to the value of between £3,000,000 and £4,000,000. The chief imports are raw silk, sugar, coal, coffee, tea, rice. The manufactures include machinery, leather and leather goods, woollens, flour, silks, chemicals, &c. California is intersected with various lines of railway, and it has now ample means of communication with the Eastern States. The principal town and port, but not the capital, is San Francisco. The seat of the legislature is at Sacramento City. Of the other towns the most important are Los Angeles, Oakland, San José, San Diego.

Population, Education, &c.—The Spanish Californians are now a small section of the community The Indian population, now few and scattered, seems at one time to have been great, as evidenced by the remains of numerous villages in the great valley. The main part of the population is of English blood, and chiefly of United States origin, though almost every nation has its representatives. The immigration of Chinese has been restricted by legislative enactment. Higher education is provided in the University of California, at Berkeley, 9 miles from San Francisco, the Leland Stanford Junior University, normal schools, colleges, seminaries for women, &c. Common school education is free, the expenditure being met by state land grants, municipal and district taxes, &c. The Lick Observatory on Mount Hamilton possesses one of the largest refracting telescopes in the world. In 1860 the population was 379,994; in 1880, 864,694. In 1890 it was 1,208,130, including 12,355 Indians, and 71,066 Chinese; in 1900 the total was 1,485,053. The Roman Catholics are the most numerous as a religious body, and next to them come the Methodists, Episcopalians, Presbyterians, Baptists, &c.

History. — California was discovered by the Spaniards, and its shores were examined by Cabrillo in 1542. In 1578 it was visited by Sir F. Drake, who gave it the name of New Albion. In 1602 Sebastian Viscayno touched at Monterey, and proclaimed the neighbouring country to be Spanish territory. In 1768 Upper California was occupied by an expedition sent from Mexico, and colonized by the establishment of mission-stations under the Franciscans. In 1822, California, along with the rest of Mexico, became independent of Spain, but the authority of Mexico over it was latterly very loose. War having arisen between Mexico and the United States, the latter occupied California, which in 1848 was ceded by Mexico (with a much greater area than the present state). In 1848 it became known that the country was rich in gold, and soon after multitudes began to arrive from all quarters; so that in four years the population numbered about 260,000. Such an influx of people brought many lawless characters; robbery and murder became frequent. Lynch-law was in many places set up, and vigilance committees established. In 1849 the people adopted a regular government, and California was admitted as a state of the Union in 1850, since which time its progress has been very remarkable.

CALIFORNIA, Gulf of, a gulf on the W. coast of North America, in Mexico, lying between the peninsula of Lower California and the mainland of Mexico. It is about 700 miles long, and, through most of its length, is less than 100 miles wide. It receives the river Colorado at its northern extremity, contains numerous islands and shoals, and is of difficult navigation.

CALIFORNIA, Lower or Old, a territory of the Republic of Mexico, forming a peninsula in the Pacific Ocean, united on the N. to the continent, from which it is separated on the E., throughout its entire length, by the Gulf of California (see preceding art.). It is about 750 miles in length, and in different places 30, 60, 90, and 150 miles wide. The coast forms many capes, bays, and havens, and is fringed by numerous islands. A chain of mountains extends throughout, of which the greatest height is from 4500 to 4900 feet above the sea, the latter being the height attained by its culminating point, Cerro de la Giganta. The chain is almost destitute of vegetation, having only here and there a few stunted trees or shrubs. It has a single volcano, and possesses distinct traces of volcanic origin. The foot of the range is covered with cactuses of remarkable size. Some of the hollows, where the soil is formed of decomposed lava, are tolerably fertile. On the plains the soil is often of the richest quality, and when the advantage of irrigation can be obtained, raises the most abundant crops; but this advantage often fails, owing to the great deficiency of water. Rain seldom falls in summer, and the streams are very insignificant. The climate varies much according to locality. On the coast of the Pacific the temperature ranges in summer from 58° to 71°; the sky is peculiarly clear, and perfectly cloudless, except towards sunset, the tints of which are remarkable for variety and beauty. At a distance from the coast, where the sea breeze is not enjoyed, the summer heat is excessive. The principal vegetable products are maize, manioc, wheat, grapes, oranges, lemons, pine apples, and many other varieties of the finest fruits. In the valleys horses, sheep, and cattle are reared successfully. The fish on the coast are very abundant, and a pearl-fishery was long very successfully carried on. Gold-mining is also carried on with considerable success. La Paz, in the south, is the capital (pop. 6000); Ensenada, in the north, is a rising port. California was explored by order of Cortez in 1532-33. It was visited by the celebrated navigator Drake, who gave it the name of New Albion. In 1642 the Jesuits formed establishments upon it, built villages, and civilized the natives. On their expulsion the missions were carried on by the Dominicans. Population (1895), 42,245, of whom perhaps a half are Indians.

CALIGULA, Caius Cæsar Augustus Germanicus, son of Germanicus and Agrippina, was born A.D. 12, in the camp at Antium, and brought up among the legions. Here he received from the soldiers the surname of Caligula, on account of his wearing the *caligæ*, a kind of little boots in use among them. He understood so well how to insinuate himself into the good graces of Tiberius, that he not only escaped the cruel fate of his parents, and brothers, and sisters, but was even loaded with honours. Whether, as some writers inform us, he removed Tiberius out of the way by slow poison, is uncertain. When the latter was about to die he appointed, according to Suetonius, Caligula, and the son of Drusus, Tiberius Nero, heirs of the empire. But Caligula, universally beloved for the sake of his father Germanicus, was able, without difficulty, to obtain sole possession of the throne. Rome received him joyfully, and the distant provinces echoed his welcome. His first actions were just and noble. He interred, in the most honourable manner, the remains of his mother and of his brother Nero, set free all state prisoners, recalled the banished, and forbade all prosecutions for treason. He conferred on the magistrates free and independent power. Although the will of Tiberius had been declared by the senate to be null and void, he fulfilled every article of it, with the exception only of that abovementioned. When he was chosen consul he took his uncle, Claudius, as his colleague. Thus he distinguished the first eight months of his reign by many magnanimous actions, when he fell sick. After his recovery, by a most unexpected alteration, which has given good grounds to suspect his sanity, he suddenly showed himself the most cruel and unnatural of tyrants. The most exquisite tortures served him for enjoyments. During his meals he caused criminals, and even innocent persons, to be stretched on the rack and beheaded: the most respectable persons were daily executed. In the madness of his arrogance he even considered himself a god, and caused the honours to be paid to him which were paid to Apollo, to Mars, and even to Jupiter. He also showed himself in public with the attributes of Venus and of other goddesses. He built a temple to his own divinity. At one time he wished that the whole Roman people had but one head, that he might be able to cut it off at one blow. He frequently repeated the words of an old poet, 'Oderint dum metuant'—let them hate so long as they fear. He squandered the public money with almost incredible prodigality. One of his greatest follies was the building of a bridge between Baiæ and Puteoli (Puzzuoli), in order that he might be able to boast of marching over the sea on dry land. He had it covered with earth, and houses built on it, and then rode over it in triumph. He gave a banquet in the middle of the bridge, and to celebrate this great achievement ordered numbers of the spectators whom he had invited, to be thrown into the sea. On his return, he entered Rome in triumph, because, as he said, he had conquered nature herself. After this, he made preparations for an expedition against the Germans, passed with more than 200,000 men over the Rhine, but returned after he had travelled a few miles, and that without having seen an enemy. Such was his terror, that, when he came to the river, and found the bridge obstructed by the crowd upon it, he caused himself to be passed over the heads of the soldiers. He then went to Gaul, which he plundered with unexampled rapacity. Not content with the considerable booty thus obtained, he sold all the property of both his sisters, Agrippina and Livilla, whom he banished. He also sold the furniture of the old court, the clothes of Marcus Antoninus, of Augustus, Agrippina, &c. Before he left Gaul, he declared his intention of going to Britain. He collected his army on the coast, embarked in a magnificent galley, but returned when he had hardly left the land, drew up his forces, ordered the signal for battle to be sounded, and commanded the soldiers to fill their pockets and helmets with shells, while he cried out, 'This booty, ravished from the sea, is fit for my palace and the capitol!' When he returned to Rome, he was desirous of a triumph on account of his achievements, but contented himself with an ovation. Discontented with the senate, he resolved to destroy the greater part of the members, and the most distinguished men of Rome. This is proved by two books which were found after his death, wherein the names of the proscribed were noted down, and of which one was entitled *Gladius* (Sword), and the other *Pugillus* (Dagger). He became reconciled to the senate again when he found it worthy of him. He supported public brothels and gaming houses, and received himself the entrance money of the visitors. His horse, named *Incitatus*, was his favourite. This animal had a house and a servant, and was fed from marble and gold. Caligula had caused him to be admitted into the college of his priests, and was desirous of making him a consul also. He even had the intention of destroying the poems of Homer, and was on the point of removing the works and images of Virgil and Livy from all libraries: those of the former, because he was destitute of genius and learning; those of the latter, because he was not to be depended upon as a historian. Caligula's morals were, from his youth upward, corrupt; he had committed incest with all his sisters. After he had married and repudiated several wives, Cæsonia retained a permanent hold on his affections. A number of conspirators, at the head of whom were Chærea and

Cornelius Sabinus, both tribunes of the prætorian cohorts, murdered him in the twenty-ninth year of his age, and the fourth of his tyrannical reign, which thus lasted from A.D. 37 to 41.

CALIPERS, **Caliper Compasses**, a sort of compasses with arched legs, used to take the diameter of any round body, as of shot or shells, the bore of ordnance, the thickness of timber, &c. There are various forms and modifications of the instrument according to the special purpose for which it is intended. Gunners' calipers are engraved with sets of numbers connected with artillery.

CALIPH (successor, successor and representative) is the name assumed by the successors of Mohammed in the government of the faithful and in the high-priesthood. *Caliphate* is therefore the name given by historians to the empire of these princes which the Arabs founded in Asia, and, impelled by religious enthusiasm, enlarged, within a few centuries, to a dominion superior in extent to the Roman empire. The title is still borne by the Sultan of Turkey. Mohammed, in the character of the prophet of God, made himself the spiritual and temporal ruler of his people. In the following account the dates both of the Hegira and the Christian year are often given. The difference in the mode of computing the Mohammedan year has caused considerable divergencies among authorities in regard to the exact dates of the particular events of Mohammedan history.

After the death of the Prophet the election of a successor occasioned considerable excitement, Mohammed having left no son and nominated no successor. Abdallah Ebn Abu Koafas, called *Abubekr*, that is, *father of the virgin* (because his daughter Ayesha was the only one of the wives of Mohammed whom he had married as a virgin), obtained the victory over Ali, the cousin and son-in-law of Mohammed, and became the first caliph, A.D. 632 (year of the Hegira 11). Victorious over enemies at home, by the aid of his general Khaled, 'the Sword of God', he proceeded, as the Koran directs, to spread the doctrines of Mohammed by arms among the neighbouring nations. With the watchword *conversion or tribute*, a numerous army, consisting entirely of volunteers inspired with zeal for the holy war, penetrated into Syria and Mesopotamia, but before much could be done, Abubekr died after he had filled the place of the Prophet two years and four months.

Omar, another father-in-law of the Prophet, now became second caliph, and under him the war was continued. The Moslems having once acquired a strong footing in Syria by the treacherous surrender of Bosra, they undertook, under Khaled, the siege of Damascus, and having repulsed two large armies, sent by the emperor Heraclius to the relief of the city, they obtained possession of it by a capitulation (A.D. 635), the terms of which were perfidiously broken, Khaled pursuing and slaughtering the retreating Christians. By him and other generals, though not without a brave resistance on the part of the Greeks, the subjugation of Syria was completed (A.D. 638, of the Hegira 17). Jerusalem having been compelled to surrender (A.D. 636, Heg. 15), Omar proceeded thither in person to fix the terms of capitulation, which subsequently served as a model in settling the relations of the Moslems to the subject Christians. These terms were carefully observed by the conscientious caliph. The new Persian empire of the Sassanidæ was also overthrown, and Mesopotamia and other extensive regions overrun. Equally successful was the Mohammedan general, Amru, in Egypt, which was subjected to the caliphate in two years (641). Omar was the first who bore the appellation of *Emir al Moumenin* (Prince of the Faithful)—a title inherited by all succeeding caliphs. Many of these conquests were over Christian populations who readily changed their creed and adapted themselves to the new rule.

After the murder of Omar by a revengeful slave (A.D. 644, Heg. 23), a council, appointed by him on his death-bed, chose Osman, or Othman, son-in-law of the Prophet, passing over Ali. Under him the empire of the Arabs continued to expand. From Egypt the tide of conquest advanced westward along the northern coast of Africa, as far as Ceuta. Cyprus too (A.D. 647), and Rhodes (A.D. 654) were conquered; but the former was lost again two years after. An agitation against Othman now arose, partly owing to the fact that he favoured and aggrandized his own family connections in every way, and intrusted the provinces, not to the most capable, but to his favourites. To many also the claims of Ali to the caliphate were deemed superior to those of Othman. The dissatisfaction thus excited occasioned a general insurrection in the year 656 (Heg. 34), which terminated in Othman's death.

Ali, the son-in-law of the Prophet by Fatima, became the fourth caliph, by the choice of the people of Medina, and is regarded as the first legitimate possessor of the dignity by a numerous sect of Mohammedans, which gives him and his son, Hassan, almost equal honour with the Prophet. This belief prevails among the Persians, and others who belong to the *Shiite* sect as opposed to the *Sunnites* or orthodox. Instead of being able to continue the conquests of his predecessors, Ali always had to contend with domestic enemies. Among these was Ayesha, the widow of the Prophet, called the *mother of the faithful*; also Tellah, Zobeir, and especially the powerful Moawiyah, governor of Syria, who all laid claim to the government. These were able to create suspicion, and spread the report that Ali had instigated the murder of Othman. In vain did he endeavour to repress the machinations of his enemies, by intrusting the government of the provinces to his friends. Nowhere were the new governors received. The discontented collected an army, and made themselves masters of Bassora. Ali defeated it, and Tellah and Zobeir fell; but he could not prevent Moawiyah and his friend Amru from extending their party, and maintaining themselves in Syria, Egypt, and even in a part of Arabia. Three men of the sect of the Kharejites proposed to restore concord among the faithful, by slaying each one of the three heads of the parties, Ali, Moawiyah, and Amru; but Ali only fell (A.D. 661, Heg. 40). He was a man of a cultivated mind, and was the author of a collection of sentences or moral maxims, &c. His son, the mild, peaceful Hassan, had no desire to defend the caliphate against the indefatigable Moawiyah; a treaty was concluded between the two, by which Hassan solemnly abdicated the government (661). Some years later he perished by poison, said to have been administered by one of his wives at the instigation of Moawiyah.

Moawiyah I. transferred the seat of the caliphate from the city of the Prophet, Medina, where it had hitherto always been, to Damascus, in the province of which he had formerly been governor (A.D. 673, Heg. 54). With him began the series of the caliphs called *Ommiades* (or *Ommayads*), which name this family bore from Moawiyah's progenitor, Ommiyah. Not long after his accession he was obliged to quell an insurrection of the Kharejites by a campaign, and a rebellion at Bassora by severe punishments. He then seriously meditated the entire subversion of the Byzantine Empire (which see). Rhodes was attacked, and the famous colossus was broken in pieces. His son Jezid marched through Asia Minor, meeting but little resistance; then crossed the Hellespont and laid siege to Constantinople, but was obliged to raise it (A.D. 669, Heg. 49). Other generals were more successful against the Turks in Khorasan, and the regions extending to the borders of India.

The next caliph, Jezid (or Yazid), was not altogether a worthy successor of his father, the politic Moawiyah (A.D. 680, Heg. 60). At first he was not acknowledged by the two holy cities, Mecca and Medina, which, as long as the caliphs had resided in the latter city, had enjoyed a principal voice in their election, but which had not been consulted when Moawiyah, according to the custom of the caliphs, appointed his successor in his lifetime. The discontented espoused the cause, either of Houssain, the famous son of Ali, or of Abdallah, Zobeir's son, both of whom had laid claim to the caliphate. A rebellion of the inhabitants of Irak, in favour of Houssain, led by Moslim, Houssain's cousin, was suppressed by the prudence and decision of Obeidallah, governor of Cufa; and Houssain, who had accepted the invitation of the conspirators, was killed (A.D. 680, Heg. 61), to the great grief and rage of all those who took part with Ali's family—a feeling still cherished by the Shiites. Abdallah Ebn Zobeir was recognized as caliph in Medina, where Jezid was detested for his voluptuousness and scepticism. On this account Medina was invested, stormed, and sacked; and Mecca, in which Abdallah took shelter, was besieged, but during the siege Jezid died.

After Jezid's death, (A.D. 683, Heg. 64) his son Moawiyah II., a weak but pious youth, became caliph, but after a reign of forty days he died when he was meditating abdication. By this time Abdallah Ebn Zobeir had caused himself to be proclaimed as Prince of the True Believers, and he had a powerful following. For a period anarchy prevailed. Irak, Hejaz. Yemen, and Egypt acknowledged Abdallah Ebn Zobeir as caliph. In Syria, Dehac, regent to Abdallah, was at first chosen caliph; but the people of Damascus appointed Merwan I., of the race of the Ommiades, caliph, who made himself master of all Syria and Egypt. Khorasan separated from the caliphate, and submitted to a prince of its own choosing—the noble Salem. In the following year (A.D. 684, Heg. 65) Soliman Ebn Sarad excited a great rebellion of the discontented in Syria and Arabia, and pronounced both caliphs deposed, but was defeated by the experienced soldier Obeidallah. Merwan (who died in 685) had been compelled to promise on oath to leave the caliphate to Khaled, the son of Jezid, yet he nominated his son Abdalmelek as his successor. Under him (A.D. 685, Heg. 65) Mokthar, a new rebel against both caliphs, was subdued by one of them, Abdallah (A.D. 686, Heg. 67); but this only made Abdallah more formidable to Abdalmelek, who, in order to be able to direct all his forces against him, concluded a peace with the Greek emperor, Justinian II., in which, reversing the order of the Koran, he conceded to the Christians a yearly tribute of 50,000 pieces of gold. He then marched against Abdallah, defeated him twice, and took Mecca by assault. In this last conflict Abdallah fell. Thus Abdalmelek united under his dominion all the Mussulmans; but the resistance of governors and wars with the Greeks kept him constantly occupied. He was the first caliph that caused money to be coined. He died A.D. 705 (Heg. 86). Under Walid I., his son, the Arabs conquered in the E. Charasm and Turkestan (A.D. 707, Heg. 88); in the N. Galatia (A.D. 710); and in the W. Spain A.D. 711). (See Spain.) He died in 716 (Heg. 97). His brother and successor Soliman besieged Constantinople, but his fleet was destroyed by Greek fire, and his army suffered severely from famine. He died while on his way to take part in the siege in 717 (Heg. 99).

Omar II., his successor by Soliman's last will, was equally unsuccessful in the conduct of the war. Having incurred the displeasure of the Ommiades by his indulgence towards the sect of Ali, he was poisoned by them (A.D. 721, Heg. 102). Jezid II., his successor also by the disposition of Soliman, died of grief for the loss of a female favourite, of whose death he was the author (A.D. 723, Heg. 104). His successor was Hisham, who reigned till 743. He had to suppress several revolts, the chief being that of Zaid (739–40). About this time the Abbassides, descendants of Abbas, son of Abdalmotaleb, uncle of the Prophet, began to be formidable. Under Hisham an end was put to the progress of the Saracens in the W. by the energy of Charles Martel, who annihilated their armies at Tours in 732, and at Narbonne in 736. Walid II. was murdered after a reign of one year (A.D. 744, Heg. 124).

After the still briefer reigns of Jezid III. and of his brother Ibrahim, Merwan II. followed, with the surname (respectable among the Arabs) of *the Ass* (al Hemar). Ibrahim, the Abbasside leader, being imprisoned and put to death by this prince, his brother, Abul Abbas, took up the cause of the Abbassides and assumed the title of caliph. In the resulting war Merwan was twice defeated, and fell (A.D. 750, Heg. 133). With him terminates the series of caliphs of the race of Ommiyah. The furious Abdallah, uncle of Ibrahim and Abul Abbas, treacherously destroyed almost all the Ommiades by a horrible massacre at a meeting to which they had been inveigled. One of the family, Abderrahman, grandson of Hisham, having taken refuge in Spain, escaped the massacre and founded the independent caliphate of Cordova (see Spain).

Abul Abbas, first of the Abbasside caliphs, died young in A.D. 754 (Heg. 136). His brother, Abu Giafar, called *al Mansur* (the Victorious), was obliged to contend with a rival in his uncle Abdallah, whom he, however, overcame. He acquired his surname by his victories in Armenia, Cilicia, and Cappadocia. Spain was lost by him, however, as well as Africa. In the year 764 he founded the city of Bagdad on the Tigris, and transferred thither the seat of the caliphate (A.D. 768, Heg. 149). He died on a pilgrimage to Mecca, leaving immense treasures (A.D. 775, Heg. 158). Mohammed Mahdi, his son and successor, a man of a noble character, had to contend with the turbulent inhabitants of Khorasan under the pretended prophet Hakem, and died A.D 785; and Musa or Hadi, his grandson, met with the same opposition from the Ali party under Houssain. Hadi's mother was a strong-minded ambitious woman, who wished to rule her son, and with him the state, and this led him to try to poison her. She, however, caused him to be smothered before he could effect his purpose.

Hadi was followed, not by his son, but by his brother Harun (A.D. 786), who was denominated *Al Rashid* (The Upright) on account of his justice, and is famous for promoting the arts and sciences. He concluded a truce (an actual peace could never be made with Christians) with the Greek empress Irene (A.D. 788), who consented to pay him tribute. Yahya, a member of the house of Ali, disputed with him the possession of the throne, but subsequently submitted. Harun, however, tarnished his reputation by the murder of Yahya, and still more by the murder of his sister, and her favourite the Barmecide Giafar, and by the expulsion and persecution of the whole family of the Barmecides, whose services to the state and himself had been of very great value. Harun divided the empire among his three sons. Al Amin, as sole caliph, was to reign over Irak, Arabia, Syria, Egypt, and the rest of Africa: under him Al Mamun was to govern Persia, Turkestan, Khorasan, and the whole East; and Motassem was to rule Asia Minor, Armenia, and all the countries on the Black Sea. The younger brothers were to succeed Amin in the caliphate. At Thus, in Khorasan, through which Harun was passing, in order to quell a rebellion that had broken out in Samarcand, he was arrested by death, of which he had been forewarned by extraordinary dreams (A.D. 809, Heg. 190).

Al Amin the faithful (his proper name was *Mohammed*) was undeserving of this name. Untrue to his obligations as a ruler, and addicted to all kinds of sensuality, he left the discharge of his duties to his vizier Fadhel. The vizier, from hatred of Mamun, persuaded the caliph to appoint his son his successor, and deprive Motassem of his portion of territory. A war arose between the brothers. Mamun's general, Thaher, defeated the armies of the caliph, took Bagdad, and caused Amin to be put to death (A.D. 813, Heg. 194).

Mamun was recognized as caliph. Nobler in his inclinations than Amin, he cherished the arts and sciences; but, like his brother, he left the government and armies to his ministers. His measures to secure the caliphate to the Alides in order to please Riza, his favourite, excited the powerful Abbassides to an insurrection. They declared Mamun to have forfeited the throne, and proclaimed Ibrahim caliph, but submitted again, after the death of Riza, when the caliph had changed his sentiments. The vast empire of the Arabs, embracing numberless provinces in two quarters of the globe, could hardly be held under his sceptre. There is but one step, and that an easy one, under a weak sovereign, from a viceroyalty to a kingdom. The wisdom of the former Abbassides could only retard this evil; the faults of the latter precipitated it. Even under Harun al Raschid the Agladides had founded an independent empire in Tunis (A.D. 800, Heg. 181), as had likewise the Edrisides in Fez. Thaher, having been appointed governor of Khorasan, made himself independent. From him the Thaherides derived their origin. Mamun sent Thomas, a Greek exile, with an army against the Greek emperor, Michael II. the Stammerer. Thomas depopulated Asia Minor, and laid siege to Constantinople; but a storm destroyed his fleet (A.D. 823, Heg. 207). A second attack on the imperial city was repelled by the aid of the Bulgarians. Thomas was taken prisoner, and executed. Towards the many religious sects into which the Mussulmans were then divided Mamun acted with toleration. He died A.D. 833 (Heg. 218). During his government (about A.D. 830, Heg. 215), the African Arabs conquered Sicily and Sardinia, where they maintained themselves about 200 years, till the latter island was torn from them by the Pisans in 1016–17, and the former island by the Normans between 1061 and 1090.

Motassem, at first named *Billah* (by the grace of God), Harun's third son, built a new city, Samara, 56 miles from Bagdad, and transferred thither his residence. In his wars against the Greeks and rebellious Persians he first used Turkish soldiers. From grief at the death of his private physician, Motassem became insane, and died A.D. 842 (Heg. 227).

Vathek Billah, his son, member of the Motazelite sect, exerted himself to promote the advancement of science; but he was an enervated voluptuary, and died of nervous weakness (A.D. 846, Heg. 232). A contest for the succession, between his brother Motawackel and his son Mothadi, was decided by the already powerful and arrogant Turkish body-guard in favour of the former, the more unworthy competitor. Under Motawackel it became more and more customary to carry on all wars by means of Turkish mercenaries. Thus the Arabs were rendered unwarlike and effeminate, as must necessarily be the case in a hot climate with those who do not live in constant activity. Motawackel manifested a blind hatred of the Alides, not sparing even the memory of the deceased. He moreover evinced a malignant spirit, and a proneness to sensuality and cruelty. His own son, Montasser, trained to early indulgence in both these vices, and often barbarously treated by him, conspired against him with the Turkish body-guards, and effected his murder (A.D. 861, Heg. 247).

The Turks, who now arrogated the right of electing the caliphs, called the murderer to the throne of the faithful, and compelled his brothers, who were innocent of the atrocious act, and whose revenge they feared, to renounce the succession which had been designed for them by Motawackel. Montasser died soon after of a fever, caused by the goadings of remorse (A.D. 862, Heg. 248). The Turks then elected Mostain Billah, a grandson of the caliph Motassem. Two of the Alides became competitors with him for the caliphate. One of them, at Cufa, was defeated and put to death; but the other founded an independent empire in Tabristan, which subsisted half a century. The discord of the Turkish soldiers completed the dismemberment of the empire. One party raised to the throne Motaz, second son of Motawackel, and compelled Mostain to abdicate. Motaz Billah soon found means to get rid of him as well as of his own brother Muwiad. He then meditated the removal of the Turkish soldiers; but before he found courage to execute his projects they rebelled on account of their pay being in arrear, and forced him to resign the government. He soon after died (A.D. 869, Heg. 255). They conferred the caliphate on Mohadi Billah, son of the caliph Vathek, but deposed this excellent prince eleven months after, because he attempted to improve their military discipline.

Under Motawackel's third son, the sensual Motamed Billah, whom they next called to the caliphate, Muaffek his brother succeeded, by his prudence and courage, in overcoming the dangerous preponderance of these Turks. Motamed transferred the seat of the caliphate from Samara back to Bagdad in the year 873 (Heg. 259), where it afterwards continued. In the same year, owing to a revolution in the independent government of Khorasan, the dynasty of the Thaherides gave place to that of the Soffarides, who eventually extended their dominion over Tabristan and Segestan. The governor of Egypt and Syria, Achmet Ben Tulun, also made himself independent (A.D. 877, Heg. 263), from whom are descended the Tulunides. The brave Muaffek annihilated, indeed, the empire of the Zinghians, in Cufa and Bassora, ten years after its formation (A.D. 881, Heg. 268); but he was unable to save the caliphate from the ruin to which it was continually hastening.

Motamed died soon after him (A.D. 892, Heg. 279), and was succeeded by Muaffek's son, Mothadad Billah. He contended unsuccessfully with a new sect that had arisen in Irak—the Carmathians (A.D. 899, Heg. 286)—against whom his son, Moktaphi Billah (A.D. 902, Heg. 289), was more fortunate. He was still more successful in a war against the Tulunides, as he again reduced Egypt and Syria in 905 (Heg. 292). Under his brother, Moktadar Billah, who succeeded him at the age of thirteen years (A.D. 909, Heg. 296), rebellions and bloody quarrels about the sovereignty disturbed the government of the empire. He was several times deposed and reinstated, and finally murdered (A.D. 931, Heg. 319). During his reign Abu Mohammed Obeidallah rose in Africa, who, pretending to be descended from Fatima, daughter of the Prophet (therefore from Ali), overthrew the dynasty of the Agladides in Tunis, and founded that of the Fatimites (A.D. 910, Heg. 298). Not satisfied with reigning independent of the caliph, this party, as descendants of the Prophet, asserted themselves to be the only lawful caliphs.

Shortly afterwards the dynasty of the Bouides, in Persia, rose to authority and power (A.D. 925, Heg. 315). Khorasan was still independent. The only change was that the Samanides had taken the place of the Soffarides. In a part of Arabia the heretic Carmathians ruled; in Mesopotamia, the Hamadamites. In Egypt, which had just been recovered, Akschid, from a governor, was called to be a sovereign. From him descended the Akschidites. Kaher Billah, Mothadad's third son, merited his fate, on account of his malice and cruelty. The Turkish soldiers having recovered their power drove him from the throne into exile (A.D. 934, Heg. 322), in which he perished five years afterwards. Rhadi Billah, his brother, bore the dignity of an *emir al omra* (captain of the captains), with which the exercise of absolute power, in the name of the caliph, was united; and thus the caliph was more and more thrown into the back-ground. The first who was invested with this dignity was Raik; but it was soon torn from him by the Turk Jakan, by force of arms, in the year 939 (Heg. 327). Jakan extended the power of the office to such a degree as to leave the caliph nothing but the name of his temporal sway, and even assumed the right of determining the succession to the throne. Raik was indemnified by receiving Cufa, Bassora, and Irak Arabi as an independent government.

The next caliph, Motaki Billah, Moktader's son, made an effort to regain his independence by the murder of Jakun; but he was soon compelled by the Turkish soldiers to appoint Tozun, another of their countrymen, emir, who made this office hereditary. He formally devised it to a certain Schirzad, but it soon came into the possession of the Persian royal house of the Bouides, whose aid the succeeding caliph, Mostaki Billah, solicited against the tyranny of Schirzad. The first Bouide emir, Moezeddulat, left it as an inheritance to his posterity. Not the caliph but the emir now reigned in Bagdad, though over only a small territory. In every remote province there were independent princes.

To continue the catalogue of the names of those who were henceforward caliphs would be superfluous, for these Mussulman *popes* had not by any means the power of the Christian. It would be too tedious to trace the branches into which the history of the caliphate is now divided; but we must briefly show the great changes which the different states and their dynasties have undergone, and which gave rise to the dominion of the Ottoman Porte.

During the minority of the Akschidite Ali, the Fatimite Morz Ledinillah, at that time caliph in Tunis, subjugated Egypt in 969 (Heg. 358), and founded Cairo, which he made the seat of his caliphate. There were, consequently, at this time three caliphs—at Bagdad, Cairo, and Cordova—each of which declared the others heretics. But the Fatimites as well as the Abbassides fell under the power of their viziers, and, like them, the Ommiades in Cordova were deprived of all power by the division of Spain into many small sovereignties, till they were entirely subverted by the Morabethun. See SPAIN.

Ilkan, king of Turkestan, having conquered Khorasan, and overthrown the Samanides, was expelled again by Mahmud, prince of Gazna, who founded there the dominion of the Gaznevides, in 998 (Heg. 388), who were soon, however, overthrown in turn by the Seljuk Turks under Togrul Beg, in 1030 (Heg. 421). This leader conquered also Charasm, Georgia, and the Persian Irak. Called to the assistance of the Caliph Kajem Bemeillah, at Bagdad, against the tyranny of the Bouide emirs, he proceeded to Bagdad, and became emir himself in 1055 (Heg. 448), by which means the dominion of the Turks was firmly established over all the Mussulmans. To his nephew, Alp Arslan (who defeated and took prisoner the Greek emperor Romanus Diogenes), he left this dignity, with so great power that these Turkish *emirs al omra* were frequently called the *Sultans of Bagdad.* Turkish princes, who aspired to be sovereigns in the other provinces, were at first satisfied with the title of *atabek* (father, teacher), such as the atabeks of Irak and Syria, of Azerbijan, Farsistan (Persia), and Laristan. It was the atabeks of Syria and Irak with whom the Crusaders had principally to contend. The first was called *Omadeddin Zenghi;* by the Franks, *Sanguin.* They were afterwards termed *sultans.* The Caliph of Bagdad was recognized by all as the spiritual sovereign of all Mussulmans: his temporal authority did not extend beyond the walls of Bagdad. Noureddin, Zenghi's son, being requested by the Fatimite caliph Adhed to protect Bagdad against his vizier, sent to Cairo, in succession, Shirkuh and Salaheddin or Saladin; but the latter overthrew the Fatimites (as schismatic *anti-popes*), and usurped the authority of Sultan of Egypt in 1170 (Heg. 556), with which he united Syria, after Noureddin's death. This is the great Salaheddin (Saladin), the formidable enemy of the Christians, the conqueror of Jerusalem. The dynasty which commenced with him was called, from his father, Ayoub, the *Ayoubites.* They reigned over Egypt till expelled by the Mamelukes in 1250. The Seljuk sultans of Irak were overthrown in 1194 (Heg. 590) by the Charasmians; and as those of Khorasan were extinct, there remained of the Seljuk dominions nothing but the Empire of Iconium or Roum, in Asia Minor, from which the present Turkish empire derives its origin. See OTTOMAN EMPIRE.

The Charasmian sultans extended their conquests far into Asia, until their territories were invaded by the Tartars under Genghis Khan, in 1220 (Heg. 617). They were finally totally destroyed by his son Octai. Bagdad, also, the remains of the possessions of the caliphs, became the easy prey of a Mongol horde under Holagu, in 1258 (Heg. 636), by the treachery of the vizier Al Kami, and a slave, Amram, under the fifty-sixth caliph Motazem. The nephew of the cruelly murdered Motazem fled to Egypt, where he continued to be called caliph under the protection of the Mamelukes, and bequeathed the Mohammedan *popedom* to his posterity. When the Turks conquered Egypt in 1517, the last of these nominal caliphs was carried to Constantinople and died, after returning to Egypt in 1538. The Turkish sultans subsequently assumed the title of *caliph,* and have retained it to the present day, with the claim of spiritual supremacy over all Mussulmans, though this claim is little regarded out of his own dominions, and strongly disputed by the Persians.

CALIPPUS, a Greek astronomer, who was the first to discover the inaccuracy of the golden number or period invented by Meton, and attempted to remedy it by the invention of a new cycle of seventy-six years, being only six hours less than the quadruple of Meton's period. It commenced 331 B.C., and being adopted particularly by astronomers in giving the date of their observations, is frequently mentioned by Ptolemy. Though more perfect than Meton's period, it was shown to be inaccurate by Hippocrates, who substituted for it a cycle of 345 years.

CALISAYA BARK, the yellowish bark of *Cinchona Calisaya*, a tree of Bolivia and Peru. See BARK (PERUVIAN).

CALISTHENICS, or CALLISTHENICS, the art of promoting gracefulness, strength, and health by means of the lighter forms of gymnastic exercise.

CALIXTINES, or UTRAQUISTS, a sect of the Hussites in Bohemia, who differed from the Catholics principally in giving the cup in the Lord's supper to laymen, from which circumstance they got their name, derived from the Latin *calix*, 'a cup'. For their history see HUSSITES.

CALIXTUS, the name of several popes.—1. The first was a Roman bishop from 217 to 224, when he suffered martyrdom.——2. GUIDO, son of Count William of Burgundy, archbishop of Vienne, and papal legate in France, was elected in 1119, in the monastery of Clugny, successor of the expelled pope, Gelasius II., who had been driven from Italy by the Emperor Henry V., and had died in this monastery. In the same year he held councils at Toulouse and at Rheims, the latter of which was intended to settle the protracted dispute respecting the right of investiture. As the Emperor Henry V. would not confirm an agreement which he had already made on this subject, Calixtus repeated anew the excommunication which he had already pronounced against him when legate in 1112. He excommunicated also the anti-pope Gregory VIII., and renewed former decrees respecting simony, lay investiture, and the marriage of priests. Successful in his contest with the emperor on the subject of investiture by means of his alliance with the rebels in Germany, in particular with the Saxons, he made his entrance into Italy in 1120, and with great pomp into Rome itself; took Gregory VIII. prisoner in 1121, and banished him to a monastery. He availed himself of the troubles of the emperor to force him, in 1122, to agree to the Concordat of Worms. (See INVESTITURE and CONCORDAT.) After an energetic pontificate he died in 1124.——3. CALIXTUS III., chosen in 1168 in Rome as anti-pope to Paschal III., and confirmed by the Emperor Frederick I. in 1178, was obliged to submit to Pope Alexander III. As he was not counted among the legal popes, a subsequent pope was called *Calixtus III.* This was a Spanish nobleman, Alfonso Borgia, counsellor of Alfonso, king of Arragon and the Sicilies. He was made pope in 1455. He was at this time far advanced in life, but equalled in policy and energy the most enterprising rulers of the Church. He appointed an ecclesiastical commission to reconsider the case against Jeanne d'Arc, and its decision was that she died a martyr to her faith, her king, and her country. In order to appease the displeasure of the princes and nations occasioned by the proceedings of the Councils of Constance and Basel, he instigated them to a crusade against the Turks. His intention was counteracted in Germany by the discontent of the States of the Empire with the Concordat of Vienna, and in France by the appeals of the Universities of Paris and Toulouse against the tithe for the Turkish war. King Alfonso, moreover, was indignant at the refusal of the pope to acknowledge his natural son Ferdinand as king of Naples.

CALIXTUS (properly *Callisen*), GEORG, the most able and enlightened theologian of the Lutheran Church in the seventeenth century, was born in 1586 at Medelbye, in Schleswig, and educated at Flensborg and Helmstedt. In 1609 he visited the universities of the south of Germany; in 1612 those of Holland, Britain, and France, where his intercourse with the different religious parties and the greatest scholars of his time developed that independence and liberality of opinion for which he was distinguished. In 1614 he was made professor of theology at Helmstedt, and he held this post till his death in 1656. His treatises on the authority of the Holy Scriptures, transubstantiation, celibacy, supremacy of the pope, and the Lord's supper belong, even according to the judgment of learned Catholics, to the most profound and acute writings against Roman Catholicism. But his genius and the depths of his exegetic and historical knowledge exposed him to the persecutions of the zealots of his time. His assertion that the points of difference between Calvinists and Lutherans were of less importance than the doctrines in which they were agreed, and that the doctrine of the Trinity was less distinctly expressed in the Old Testament than in the New, and his recommendation of good works, drew upon him the reproach of heresy. The Elector John George I. of Saxony protected him in 1655, at the Diet of Ratisbon, against the Lutheran theologians. His historical investigations and his philosophical spirit shed new light on dogmatic theology and the exegesis of the Bible. He made Christian morality a distinct branch of science, and, by reviving the study of the Christian fathers and of the history of the Church, prepared the way for Spener, Thomasius, and Semler. Under him were educated his son, Friedrich Ulrich Calixtus, and many other enlightened theologians.

CALKING. See CAULKING.

CALLA, a genus of plants of the natural order Araceæ, consisting of herbaceous marsh plants with creeping or floating stems, cordate leaves, and spadices of small flowers enveloped in large leafy spathes. The flowers are succeeded by red berries. *C. palustris* occurs in the north of Europe and N. America. It has a creeping root-stock extremely acrid in taste, but which, when deprived of its acridity by maceration and boiling, is made by the Laplanders into a kind of bread. The Trumpet Lily, or Lily of the Nile (*Richardia æthiopica*) is sometimes referred to this genus.

CALLAN, a market town of Ireland, in the county and 13 miles S.W. of Kilkenny, on the river Owenree. It consists chiefly of four streets, that meet in the centre; the other parts of the town are composed of mean, straggling thoroughfares. The Protestant church is an old monastic building, and there are ruins of an old abbey. The Roman Catholic church is a modern edifice. There are also a modern Augustinian friary and chapel, a large substantial stone structure; and a convent where a large number of girls are educated. Pop. (1891), 1973.

CALLAO, a seaport town of Peru, the port of the city of Lima, from which it is 7 miles distant, and with which it is connected by a railway; pop. (1890), 35,492. The roadstead is one of the safest, largest, and most beautiful on the Pacific coast; and there is a dock, with an area of nearly 52 acres, constructed at a cost of £1,700,000, including the cost of eighteen steam-cranes for loading and unloading goods, a lighthouse, dock railway, &c. The chief edifice of Callao is the Fortalesa de la Independencia, in the western part of the city. On one of the public places there stands a fine group of sculpture in bronze, erected in memory of the Peruvian victory over the Spaniards in 1866. Callao is the chief emporium of the trade of Peru, importing manufactured goods, and exporting such products of the country as guano, copper ore, cubic nitre, wool, &c. The Pacific steamers call here, and there is a floating iron dock. In 1746 Callao was destroyed by an earthquake. Here, in 1820, Lord Cochrane (Earl of Dundonald) performed the daring exploit of cutting out the *Esmeralda*, a 40-gun Spanish frigate, from under the guns of the castle. As a result of the two days' fighting near Lima on Jan. 13 and 15, 1881, Callao surrendered to the Chilians, having previously destroyed its forts and shipping (17th Jan.).

CALLCOTT.—1. John Wall, an eminent composer, born at Kensington in 1766, at first intended to become a surgeon, but abandoned the intention, and devoted himself to music. In 1785 he competed for the prizes of the Catch Club, and gained three out of four gold medals. In the following decade the same club awarded him twenty medals. In 1790, when Haydn arrived in England, he studied under him, and the same year obtained from Oxford the degree of Musical Doctor. In 1805 he published his Musical Grammar; and in 1806 was preparing to deliver lectures on music at the Royal Institution, when his mind gave way. He never completely recovered, and died in 1821.——2. Sir Augustus Wall, brother of the above, born at Kensington in 1779, studied portrait-painting under Hoppner, but soon discovered that his genius lay in another department of art, and was so successful in his delineation of landscape, that in 1807 he was elected an associate of the Royal Academy. In 1827 he married Mrs. Graham, widow of Captain Graham, R.N., a lady well known in the literary world. In 1837 he was knighted, and in 1843 was appointed by her majesty keeper of the royal collections of pictures. He suffered much from ill health for many years before his death, which took place on 25th November, 1844. Callcott excelled in the delineation of coast scenes. Like Turner, he has been called the 'Modern Claude.'

CALLET, Jean François, an eminent mathematician, born at Versailles in 1744, completed his studies at Paris in 1768, and in 1779 gained the prize which the Academy of Arts at Geneva had proposed for *escapements* in watches. In 1788 he was appointed professor of hydrography at Vannes, and shortly after obtained the same appointment at Dunkirk. He was afterwards professor of the geographical engineers at the Depôt de la Guerre, Paris, and died in 1798. He is best known by his Tables of Logarithms.

CALLIMACHUS, a Greek poet and grammarian, born at Cyrene, in Libya, of a noble family; flourished under the reign of Ptolemy Philadelphus, about 250 years before Christ. He opened in Alexandria a school of grammar, that is, of the belles-lettres and liberal sciences, and could boast of several scholars of distinguished attainments, such as Eratosthenes, Apollonius Rhodius, Aristophanes of Byzantium, &c. Ptolemy Philadelphus presented him with a place in the museum, and gave him a salary, as he did other men of learning. After the death of Philadelphus, he stood in equal favour with Ptolemy Euergetes. Under these circumstances he wrote most of his works, the number of which was very considerable. With the exception of some fragments, all that we have of these is seventy-two epigrams and six hymns. His poem on the hair of Berenice has been preserved in the Latin adaptation of Catullus (De coma Berenices). Callimachus' poems bear the stamp of their age, which sought to supply the want of natural genius by a great ostentation of learning. Instead of noble, simple grandeur, they exhibit an overcharged style, a false pathos, and a straining after the singular, the antiquated, the learned. His elegies are mentioned by the ancients with great praise, and served Propertius as models. The best edition of Callimachus is by J. A. Ernesti (Leyden, 1761, two vols.), which, as well as the edition of Grævius (Utrecht, 1697, two vols.), contains Spanheim's learned commentary. The newest and best edition of the hymns and epigrams is that of Meineke (Berlin, 1861).

CALLINGER, or Kalinjar, a hill fort in India, N. W. Provinces, division of Allahabad, and district of Banda, 90 miles south-west of the town of Allahabad. The summit of the hill on which it stands is at least 1200 feet above the plains below. At the south-eastern base of the hill is a decaying village, which was formerly a place of considerable importance and the capital of a rajahship. The whole summit of the hill, comprehending a plain 5 miles in circuit, is encompassed by an immense rampart of Mohammedan construction. It was surrendered to the British in 1812. There are a number of interesting caves, tombs, temples, and statues here.

CALLIOPE, one of the Muses, daughter of Jupiter and Mnemosyne. She presided over eloquence and heroic poetry. She is said to have been the mother of Orpheus by Apollo. She was represented with an epic poem in one hand and a trumpet in the other, and generally crowned with laurel.

CALLISEN, Henry, a physician and surgeon, was born in 1740, at Pentz, in Holstein. He educated himself by his own exertions, and was made, in 1771, chief surgeon in the Danish fleet, and in 1773 professor of surgery at the university in Copenhagen. He wrote in 1777 his Institut. Chirurgiæ hodiernæ, which was received with applause by all Europe. In Vienna and at the Russian universities lectures are given on them. There are also excellent essays by him in the medical journals. He died at Copenhagen, February 5, 1824.

CALLISTHENES, a Greek philosopher and historian, a native of Olynthus, was appointed to attend Alexander in his expedition against Persia. His republican sentiments rendered him unfit for a courtier, added to which he had no small share of vanity. But his unpardonable crime was his opposition to the assumption of divine honours by that conqueror. The conspiracy of Hermolaus affording a pretext for a charge of treason, he was apprehended. Historians disagree as to his fate, but most of them admit that he was for some time carried about with the army in the ignominious character of a convicted traitor. Aristotle states that he died of a disease contracted under this treatment. Ptolemy asserts that he was crucified; Justin, that he was disfigured and confined in a cage, with a dog for his companion, until Lysimachus enabled him to terminate his sufferings by poison. He wrote a History of the Actions of Alexander, and other historical works.

CALLISTO, in mythology, a nymph of Artemis, daughter of Lycaon, king of Arcadia. Zeus loved her, assumed the shape of Artemis, and seduced her. The fruit of her amour, called *Arcas*, was hid in the woods, but preserved. She was changed by the jealousy of Hera into a bear. Zeus placed her, with her son, among the stars, where she still shines as the Great Bear.

CALLISTRATUS, son of Callicrates, an Athenian, was one of the first orators of his time, and is said to have produced such an effect on Demosthenes, when a very young man, by one of his speeches, that he for the first time seriously resolved to devote himself to oratory. He was employed on several embassies, but ultimately experienced the fate of most of the Athenian demagogues, by being driven into exile. Having ventured to return without having been recalled, he was put to death, B.C. 356.

CALLOT, Jacques, an eminent engraver, was born about 1593 at Nancy. He vanquished by perseverance every obstacle which obstructed his perfection in his art. He twice ran away from his parents, who intended him for another profession, fled to Italy, and learned drawing in Rome under Giul. Parigi, engraving under Philip Thomassin, and became afterwards, at Florence, a disciple of Canta-Gallina, and at Nancy of Claudé Henriet. He soon gave himself up entirely to his love for engraving, and preferred etching, probably because his active and fertile genius could in that way express itself more rapidly. In the space of twenty years he designed and executed about 1600 pieces. (See the catalogue in the Cabinet de Singularités d'Architecture, Peinture, Sculpture et Gravure, by Le Comte, vol ii. pp. 376 to 392, and Gersaint's Catalogue de Lorangère.) Most of his pieces, except sacred subjects, are representations of battles, sieges, dances, festive processions. The Misères et Malheurs de la Guerre, in eighteen pieces, are considered the best. He executed works of this kind for Cosmo II. of Florence, Louis XIII. of France, and the Duke of Lorraine. He was so strongly inclined to the comic, that this disposition appears even in his representations of sacred subjects, for instance, in the Temptation of St. Anthony. He not only introduced some burlesque and grotesque figures in his engravings, but executed whole pictures in this style, in which his whole art is displayed. His Fair and his Beggars are called his best pieces. He was the first who used in his etchings the hard varnish—the *vernice grosso dei lignaiuoli* of the Italians. He died at Nancy in 1635. He was distinguished for piety, magnanimity, and regularity of life. (See the Biography of Callot by Gersaint, or that of Bouchot, Paris, 1890.)

CALLUNA. See Heath.

CALLUS is an abnormal hard growth whether carneous or osseous. The new growth of bony substance between the extremities of fractured bones, by which they are united, is an instance of the latter. External friction or pressure produces the former, as in the hands of labourers, and the feet of persons who wear tight shoes. See Corn.

CALMAR, the principal city of Smaland, in Sweden, on the Baltic Sea, is situated opposite to Oland, on the island of Quarnholm, and has (1898) 12,582 inhabitants. It has a small but good harbour, and carries on considerable trade in wood, metals, and tar. It has also manufactures of woollen cloth, and is the residence of a bishop, and of the governor of the province. The well-fortified castle of Calmar lies outside of the city, on the Strait of Oland. Here was signed in 1397 the treaty called the Union of Calmar, by which the three Scandinavian kingdoms Denmark, Norway, and Sweden were united under Margaret, hereditary Queen of Denmark, and widow of Haco, King of Norway. This union continued (with an interruption, however, on the side of Sweden) till it was dissolved by Gustavus Vasa in 1524.

CALMET, Augustine, distinguished as an exegetical and historical writer, was born in 1672, at Mesnil-la-Horgne, in the diocese of Toul, entered in 1688 the Benedictine order at Toul, and studied chiefly in the abbey of Moyen-Moutier. Here he became, in 1698, teacher of philosophy and theology; in 1728 abbot of Sénones, in Lorraine, and died in 1757 at Paris. He was a judicious compiler of voluminous works, such as Commentaire sur tous les Livres de l'Anc. et du Nouv. Test. (Paris, 1707–16, twenty-three vols. 4to.), Dictionnaire Hist. et Crit. de la Bible (four vols.), Histoire Eccl. et Civile de Lorraine (four vols.).

CALMS, Region of, tracts in the Atlantic and Pacific Oceans, on the confines of the trade-winds, where calms of long duration prevail. This region is not the same all the year through, but follows the course of the sun, and lies further n. or further s. according to the hemisphere in which the sun happens to be. About the winter solstice its average northern limit is in 5° n. lat., and in the months about the summer solstice its average northern limit is about 12° n. lat. The southern limit lies nearly always to the n. of the equator, varying between 1° and 3° n. lat.; but it is sometimes, though rarely, so far s. as 1° or 2° s. lat. During the months following the winter solstice its average breadth is four degrees, while in the months following the summer solstice it is about six degrees. The calms prevail especially on the northern margin of this region, but even there there is an occasional light breeze, but not sufficient to fill the sails. The climate of this region is extremely unpleasant, for the atmosphere is moist and foggy, and the sky generally overcast and gloomy. Almost every day there occurs a violent storm of thunder and lightning, accompanied by sudden blasts of wind, and by rain which falls in regular streams for hours together. It is on this account that this region is so dangerous to navigators. To increase these dangers there is between 4° and 10° n. lat., and 18° and 23° w. lon., a tract of considerable extent, which seamen call the 'rainy sea', and which, with only rare intervals of calm, is visited by almost constant storms of thunder and lightning, and violent falls of rain, from which it is very difficult for a sailing vessel to make its escape.

CALMUCKS. See Kalmucks.

CALNE, a municipal and formerly a parl. borough in Wiltshire, 31 miles n.n.w. of Salisbury. It consists mainly of one long street, and is clean and well built. There is a handsome church, with a tower designed by Inigo Jones, containing a set of fine bells. It is the centre of the manufacture of the far-famed Wiltshire bacon. Calne sent two members to Parliament down to 1832, when it lost one; in 1885 it lost the other. Pop. of mun. bor. in 1881, 2474; in 1891, 3495; in 1901, 3456.

CALOMEL. See Mercury.

CALONNE, Charles Alexandre de, a French statesman, was born in 1734, at Douai, where his father was first president of the parliament. He studied at Paris, devoted himself to the duties of an advocate at Artois, went as attorney-general (*procureur-général*) to the parliament of Douai, and was, in 1763, appointed *maître des requêtes*, in 1768 intendant of Metz, and afterwards of Lille. In 1783 he succeeded Maurepas as minister of finance, and entered upon the hopeless task of endeavouring to arrange and adjust the inextricably entangled state of the public accounts. At his suggestion an assembly of the notables, consisting of the magistrates and the heads of the most important municipalities, was called and held their first session at Versailles on 22nd February, 1787. Calonne's report on the public finances failed to give satisfaction, and after various proceedings and party conflicts he was deprived of his office, and banished to Lorraine, from whence he went to England. He now employed himself in combating the charges brought against him, to all of which the fact may certainly be opposed that he retired from office poor. On the breaking out of the revolution he supported the royalist party with much zeal, both by his pen and his journeys to various countries of Europe on their account. In 1802 he returned to Paris, where he died in October of the same year.

CALORESCENCE, the phenomenon of the conversion of invisible heat rays into rays of light. See Spectrum; Heat Spectrum.

CALORIC. The sensation and phenomena of heat were formerly attributed to a subtle imponderable fluid named caloric. Caloric was looked on as a substance ready to act in a *quasi* chemical way on ordinary matter. A large quantity of it combining with ice turned the ice into water, or combining with water turned the water into steam. It could also exist in a *free* state upon bodies. It was then ready to leave the body and pass to any body possessing a smaller proportionate quantity. Passing to the hand it produced the sensation of heat, and entering a thermometer it expanded the mercury in the bulb. It could likewise pass by *radiation* from a hotter to a colder place. The theory of the calorists, as those who held this view were called, and called themselves, is now utterly disproved, the dynamical theory of heat being now completely established. The dispute, which lasted as late as 1843, is one of the most celebrated in the whole history of physical science, and the complete settlement of it by the grand discoveries of Joule (see Heat—Dynamical Theory of) was the commencement of a new era for chemistry and physics.

CALORIMETRY, the measurement of quantities of heat. See Heat, and Specific Heat.

CALOTTISTS, or the Regiment de la Calotte, a society which sprang up at Paris in the last years of the reign of Louis XIV., and formed a regiment under the name *La Calotte* (a flat cap formerly worn by the priests), which was the symbol of the society. All were admitted whose ridiculous behaviour, odd character, foolish opinions, &c., had exposed them to public criticism. They had a singular coat of arms, on which was the sceptre of Momus, with bells, apes, rattles, &c.; on their principal standard were the words, 'Pavet Momus, luna influit.' Every one who made himself particularly ridiculous received letters-patent, and those who were most angry were most laughed at. On the death of Torsac, the colonel of the Calottists, the *éloge* (a spirited satire on the academical style), which the Calottists pronounced on this occasion, was suppressed. Aimon, colonel of the guards, hastened to Marshal Villars with their complaints, and concluded with the words, 'My lord, since the death of Alexander and Cæsar, the Calottists have not had any protector besides you,' and the order was retracted. They became, however, too bold, attacked the ministers, and even the king himself; and the regiment was, in consequence, dissolved. After the restoration, the epithet 'Régime de la Calotte,' was applied to the clerical influence in politics.

CALOTYPE. See Photography.

CALOYERS (from Greek *kalos*, beautiful, good; and *gerôn*, an old man), Greek monks, belonging to the order of St. Basil, who lead a very austere life, eating no meat and observing the fasts of the Greek Church very rigidly. They do not even eat bread unless they have earned it. During their seven weeks of Lent they pass the greatest part of the night in weeping and lamentations for their own sins and for those of others. The caloyers of the Greek Church occupy a position of much greater importance than the members of the religious fraternities of the Church of Rome, inasmuch as all the higher church dignitaries—bishops, archbishops, and patriarchs are chosen from their number. They are, indeed, the only individuals in the Greek Church who are instructed in theology, and even among them the amount of theological learning is very limited. They are commonly educated at the monasteries on Mount Athos, and on the Isle of Patmos, but besides these there are many monasteries dispersed over the Archipelago and the Morea, and a few elsewhere belonging to this class of monks. They do not all agree as to their mode of life. Some of them are cenobites; that is, they live in common. Others are anchorites, living alone, or with only one or two companions; and others again are recluses, who live in grottoes or caverns in the greatest retirement, and are supported by alms supplied to them by the monasteries. There are also convents of female caloyers. The Turks sometimes call their dervishes by this name.

CALPE. See Abyla and Gibraltar.

CALPEE, a town, Hindustan, N.W. Provinces, on the right bank of the Jumna, about 50 miles S.S.W. of Cawnpore. The original town stood on the plain, remote from the river; but repeated Mahratta incursions induced the inhabitants to remove it to its present position among extensive ravines, where there is a small fort, which commands the navigation of the Jumna. It carries on a considerable trade, principally in cotton, and is noted for its manufactures of paper and refined sugar, the latter said to be the finest in the world, but too high-priced to be in general demand. During the Sepoy mutiny Calpee became a principal rendezvous of the revolted Gwalior contingent, which was signally defeated, first by Sir Colin Campbell, in the vicinity of Cawnpore, on which it had previously made an unsuccessful attack, and afterwards at Calpee itself by Sir Hugh Rose, May 26, 1858. Pop. 14,000.

CALPRENÈDE, Gautier de Costes de la, a French romance writer, was born in Tolgou in Gascony, and died at Paris in 1663. He was one of the authors who in the seventeenth century brought into fashion a new kind of voluminous and long-spun romances of chivalry. Events from the Greek and Roman history were treated in the spirit and manner of the old romances of chivalry. Calprenede wrote Cassandra in ten vols., Cleopatra in twelve vols., Pharamond in seven, besides some tragedies. His tragedies obtained little reputation by the side of those of Corneille; but his romances were highly celebrated, and are certainly the best of their kind. He is not destitute of poetical imagination, and his characters are often dignified and well drawn, though his Artaban has become a proverbial name for exaggeration. He wrote with great rapidity. His plots, however, are constructed with care, and his stories, long as they are, are not deficient in keeping. His lady has surpassed him in boldness of romantic narration in Les Nouvelles de la Princesse Alcidiane.

CALTANISETTA, a town, Sicily, capital of the province of the same name, on the right bank of the Salso, 62 miles S.E. of Palermo. It is fortified, and has a citadel; broad and straight streets; houses well-built. In the vicinity, at Terra Pilata, are springs of petroleum and of hydrogen gas, a mud-volcano, and important sulphur mines, producing annually about 5500 tons. Caltanisetta owes its origin to the Saracens, by whom it was called *Kalat al Nisa* (the lady's castle). Pop. in 1881, 25,027.—The province of the same name, of which the above town is the capital, has an area of 1445 square miles, with a pop. of 265,930.

CALTONICA, a town, Sicily, in the province of Girgenti, and 15 miles N.W. of the town of Girgenti. The sulphur works in the neighbourhood produce annually upwards of 1000 tons of sulphur. Salt is also manufactured in the district. Pop. 7000.

CALTROP, a kind of thistle armed with prickles which grows in France, Italy, and Spain, and is troublesome by running into the feet of cattle. Hence in the military art caltrop is an instrument with four iron points disposed in a triangular form, three of them being turned to the ground, and the other pointing upwards. They are used to impede the progress of cavalry.

CALUMBA, or Colombo, the root of the *Cocculus palmatus*, a herbaceous plant, belonging to the natural order Menispermaceæ, which grows in Ceylon in the neighbourhood of Colombo, whence it is said to derive its name. It is imported in the form of round slices or cut pieces, the interior of which is of a greenish-yellow colour, while its thick and furrowed skin is greenish-brown; its odour is slightly aromatic, but somewhat nauseous; its taste extremely bitter. Calumba is often administered as a tonic, and is considered an excellent stomachic. It is regarded as of great value in chronic diarrhœa and dysentery; but it is necessary that all symptoms of inflammation should have disappeared before it can be used. It is usually given as a decoction, less commonly in the form of pills or powders. The root of a gentian, the *Frasera Walteri*, is sometimes substituted for the true calumba, and is hence frequently called the false calumba. It is not very bitter, and is almost without smell; it has no very marked effects.

CALUMET, the pipe of peace, a tobacco pipe used by the N. American Indians. Upon occasions when Indian chiefs and warriors meet in peace, or at the close of a war with those of another nation, in their talks and treaties with the whites, or even when a single person of distinction comes among them, the calumet is handed round with ceremonies peculiar to each tribe, and each member of the company draws a few whiffs. To accept the calumet is to agree to the terms proposed; to refuse it is to reject them. Some symbols of amity are found among all nations: the white flag or flag of truce of the moderns, and the olive branch of the ancients, are similar in character to the Indian calumet. There is also, it appears, a calumet used in the ceremonial declaration of war, and differently made from that of peace. Tobacco is smoked in the calumet, and the leaves of various other kinds of plants. The bowl of this pipe is made of different kinds of soft stone, especially a kind of red soap-stone, and the stem of a reed, or of some light kind of wood which is easily perforated. This stem is adorned in various ways; sometimes it is marked with the figures of animals and hieroglyphical delineations, and almost universally has beautiful feathers attached to it, disposed according to the taste of the individual, or of the tribe to which he belongs.—The *calumet dance* is the least hideous of the Indian dances. It is of a peaceful character, and seems to be intended to represent by a series of movements the power and utility of the calumet. It is rude and simple, as are all the dances of the Indians.

CALVADOS, a dangerous ridge of rocks on the N. coast of Normandy, extending (lat. 49 22′ N.) to the W. of Orne for the space of 10 or 12 miles. It is so called from a vessel belonging to the Spanish Armada which was wrecked on it, and gives its name to the department.

CALVADOS, a French department, bounded on the N. by the English Channel, on the E. by the department Eure, S. by Orne and La Manche, and W. by La Manche. Area, 2145 square miles. It comprises the ancient Auge, Bessin, and part of Lieuvin. The department is undulating and picturesque, and possesses rich pastures. The principal rivers are the Touques, Dives, Orne, and Vire, which are navigable for small vessels. Agriculture is in a more advanced state than in many other parts of France. Dairies are numerous and well managed, and large herds of cattle are brought in from the departments of Finisterre, Côtes-du-Nord, &c., to be fattened on the pastures for the markets of Paris, Rouen, and Caen. Horses of the Norman breed are extensively reared and held in high estimation. The principal manufactures are linen and lace. The latter, near Caen and Bayeux, employs about 50,000 hands. About 25,000,000 of oysters, procured in the roads of Cancale, are annually laid down in beds at the mouth of the Seulles. The department is divided into six arrondissements, containing thirty-seven cantons. Chief town, Caen. Pop., according to the census of 1886, 437,267; in 1896, 417,176.

CALVAERT, Dionys, also called *Dionisio Flammingo*, a painter, was born at Antwerp in 1555. He went very young to Italy as a landscape painter, where, in order to learn how to draw figures, he entered the school of Fontana and Sabbatini, in Bologna, with the latter of whom he visited Rome. After having passed some time in copying the paintings of Raphael, he opened a school at Bologna, from which proceeded 137 masters, and among these Albano, Guido, and Domenichino. The people of Bologna regarded him as one of the restorers of their school, particularly in respect to colouring. Calvaert understood perspective, anatomy, and architecture; but the attitudes of his figures are sometimes mean and exaggerated. He died in 1619 at Bologna, where are his best paintings.

CALVARY (in Heb. *Golgotha*, the skull, Luke xxiii. 33, or the place of the skull, Mat. xxvii. 33), an eminence situated without the walls of Jerusalem, on which Jesus Christ was crucified. Matthew relates that at the time when our Saviour expired the earth shook and the rocks split; and some modern travellers assert that the fissures in this eminence are not in the direction of the strata, and must have had an extraneous cause. Jewish traditions affirmed that Adam was buried on Mount Calvary, and some early Christians believed that Jesus Christ was crucified here that the blood shed for the redemption of the world might also purify the remains of the first sinner.—*Calvaries* are small chapels raised on hills in the vicinity of cities with a crucifix in allusion to the place and manner of Christ's death. Thus the calvary of Mount Valerian, near Paris, was composed of seven chapels, in each of which some mystery of the passion was represented.

CALVELLO, a town in the province of Potenza in Naples, kingdom of Italy, situated on a hill-slope 13 miles to the S. of the town of Potenza. It has a handsome church and two convents. Pop. 5666.

CALVERT, George, the first Baron of Baltimore, was descended of a Flemish family settled at Kipling in Yorkshire, where he was born about 1582. He was educated at Oxford, and after travelling abroad entered into the service of Robert Cecil, afterwards Earl of Salisbury. He was knighted by James I., and made clerk of the privy-council, and in 1619 was appointed one of the secretaries of state. This post he resigned in 1624, in consequence of having become a Roman Catholic. Notwithstanding this he retained the confidence of the king, who in 1625 raised him to the Irish peerage of Baltimore. He had previously obtained a grant of land in the island of Newfoundland, where he was prevented from making a settlement by the invasions of the French. He therefore resigned his claim, receiving instead of it a territory on the American continent, now forming the state of Maryland. That country was colonized under the patronage of Lord Baltimore, who displayed justice and good faith in his dealings with the Indians, and liberality to religious sects in his legislative arrangements highly creditable to his principles and character. He died in London in 1632. He wrote some political tracts, and his speeches in Parliament and letters have also been published.

CALVI, a seaport, France, on a peninsula on the N.W. side of Corsica. It has a good harbour, and a considerable trade, and ranks as a fortress of the second class, being defended by a strong citadel, flanked with five bastions. It was taken by the English in 1794 after a siege of fifty-one days, but abandoned in the following year. Pop. 2000.

CALVIN, John (so called from *Calvinus*, the Latinized form of his family name, *Cauvin* or *Chauvin*), the second great reformer of the sixteenth century, was born at Noyon in Picardy, July 10, 1509. His father, Gerard Chauvin, a cooper, dedicated him early to the church. Calvin says in a letter to Claude d'Hangest, abbot of St. Eloi at Noyon, that he was indebted to the family of this prelate for his first instruction and a liberal education. When hardly twelve years old he received a benefice in the cathedral of his native city. Six years afterwards he was appointed to a cure, which he soon exchanged for another. Thus by the means of his benefactors he enjoyed, even before his twentieth year, several benefices, and even the title and income of a cure while he was yet pursuing his studies in Paris. Here he became acquainted with his townsman Peter Robert Olivetan, his senior by some years, from whom he received the first germ of the new doctrine, which was then beginning to spread in France. He was induced by this to renounce the study of theology, and to devote himself to law at Orleans, and afterward at Bourges. He made rapid progress therein, and at the same time studied the Greek language under Melchior Wolmar, a German, who strengthened the inclination for reformation already awakened in him by Olivetan. In 1532 he returned to Paris, and in the same year he published a Latin commentary upon the two books of Seneca, De Clementia, in which he called himself by his Latinized name, *Johannes Calvinus*. In 1533 he was obliged to flee from Paris because he had composed a bold address to the king, which was delivered by his friend Nicolas Cop, rector of the university. Calvin took refuge in the house of Du Tillet, a canon at Angoulême, with whom he quietly pursued his studies, and began to collect the materials for his Christian Institution, which appeared two years afterwards. Thence he went to Nérac to Queen Margaret of Navarre, the sister of Francis I., who, not so much from a decided inclination for the new doctrine as from love for science, afforded refuge to several learned men who were obliged to leave France on account of their opinions. Calvin was very well received by her, and here became acquainted with several men who, at a future time, were useful to his party. In May, 1534, he returned to Paris; but finding that the persecution against those who were inclined to the doctrines of the reformers was still raging, and more violently than ever, he retired to Basel in the autumn of the same year. Previously, on the 4th of May, he had resigned his benefices at Noyon.

At Basel he published, in 1536, his Christian Institution, as the confession of faith of those who were persecuted in France, and condemned to the stake; in which it was his design to free them from the calumny which had been circulated from political motives, that they were rebels and Anabaptists, and had nothing in common with the Lutheran doctrine. It would be difficult briefly to relate how he went farther than Luther in regard to the doctrine of free-will, of imputative justice, and the merit of good works; but it is more easy to display the bold consequences which he drew from his doctrines. He attacked not only the supremacy of the pope, but even the authority of general councils; he does not recognize the character of a bishop as belonging to a distinct order from that of presbyter; no vows but those of baptism, and no sacraments but those of baptism and the Lord's supper; and does not hold even these essential when involuntarily omitted. The mass is to him a profanation, and the honours paid to the saints idolatry. This work, Institutio Christianæ Religionis, appeared afterwards in French, and almost every year was published by him with emendations and additions. The most complete edition was published by Robert Stephens, in 1559. The prefixed Præfatio ad Christianissimum regem, qua hic ei liber pro confessione fidei offertur, could not, however, put an end to the religious persecutions in France; since Francis I., although far from being actuated by religious fanaticism, was influenced, by political views, to continue them.

Calvin then went to Italy, to preach his doctrine there, and met with a favourable reception from the Duchess Renata of France, the daughter of Louis XII., and wife of Ercole d'Este, who subsequently professed her belief in his doctrines. But he was obliged to save himself by a hasty flight from Aosta where he was discovered. After a short visit to his native town, he resolved to return to Basel, and took the road through Geneva, where, a year before, the new doctrine had been introduced by a formal decree of the government, and Farel was very active in effecting its establishment. At the earnest entreaty of Farel, he consented to remain at Geneva and assist him in the work of reform there, although at first he was very unwilling to do so, being desirous of rest and of leisure for study. At first he undertook a course of theological instruction, to which he devoted himself exclusively, while he left the pulpit to Farel. Afterwards he was obliged to assume also the office of a preacher. Farel and he attempted to reform the manners of the inhabitants; but this enterprise, in which they had connected themselves with an equally zealous, but less able preacher (Viret), drew upon them a crowd of powerful enemies, by whom they were at last overthrown. The cause of this was the following: the Genevan church made use of leavened bread in the eucharist, and had removed the baptismal font from the church, and, moreover, abolished all holy-days, except the Sabbath. These innovations were not approved by the synod of Lausanne. The magistracy of Geneva required Farel and Calvin to comply with the decision of the synod, and commanded them, on their refusal, to leave the city in three days. This happened in April, 1538. They went to Berne; and since the exertions of the magistracy of Berne and of the synod of Zürich could not effect their recall, Calvin went to Strasburg, where Luther's doctrine had been introduced by Bucer ten years before. Bucer received him very kindly, and caused him to be appointed professor of theology. At the same time he obtained permission to erect a French church, which, on account of the great number of fugitives from France, was very important. Notwithstanding the great esteem in which he was held here, his views were still directed to Geneva; the inhabitants of which he exhorted, in two letters, to remain true to the new doctrine, when Cardinal Sadolet invited them to return into the bosom of the church. Here also, in 1540, Calvin published his work on the Lord's Supper, in which he sought to refute both the opinion of Luther, who held a doctrine with regard to the real presence of Christ in the elements allied to the Romish one of transubstantiation, and that of Zuinglius, who rejected that doctrine entirely. Calvin maintained against both that Christ was spiritually present and spiritually received in the eucharist. In a conference held at Zürich in 1549, he presented a Formula, which, by its wise moderation, restored concord.

At last, in 1541, his friends in Geneva succeeded in effecting his recall; a particular deputation besought the magistracy of Strasburg to restore him to his former flock. But as Calvin was appointed a deputy to the diet at Frankfort, and was afterwards obliged to be present at the conference at Ratisbon, he was not able to return to Geneva till September of the same year. He now laid before the council the draft of his ordinances respecting church discipline, which were immediately accepted, and published in November. In pursuance of the provisions of these, a consistory was formed, composed half of clergymen, half of laymen, in order to watch 'over the support of the pure doctrine,' and over morals. This tribunal called everybody, without exception, to account for their slightest words and actions, and referred cases where ecclesiastical censure was not sufficient, to the council, with an opinion upon them. Thus Calvin made himself director of the conduct, as well as of the opinions of the Genevese. His spirit governed exclusively in the council as in the consistory, and no one could hope to succeed who set himself in opposition to him. Thus a magistrate was deposed and condemned to two months' imprisonment 'because his life was irregular, and he was connected with the enemies of Calvin.' James Gruet was beheaded 'because he had written profane letters and obscene verses, and endeavoured to overthrow the ordinances of the church.' It is well known that Michael Servetus, passing through Geneva in 1553, was arrested, and on Calvin's accusation was burnt alive because he had attacked the mystery of the Trinity in a book which was neither written nor printed at Geneva. The friends of Calvin, naturally anxious to defend his memory, have sometimes endeavoured to justify these proceedings, but would act more judiciously by candidly admitting that, when tested by the tolerant principles which now prevail, at least among Protestants, they cannot be justified, though, at the time, there was not a man among the Roman Catholics, and scarcely one among the Protestants, who would have acted differently. He also proposed alterations in the civil legislation of the Genevese, and in the form of their government, in which some French refugees were useful to him. For the advancement of useful studies he erected the academy so happily conducted by his friend Theodore Beza.

When we consider all that Calvin did during his continuance in Geneva, we can hardly conceive how he could have accomplished so much. He preached almost daily, delivered theological lectures three times a week, attended all deliberations of the consistory, all sittings of the association of ministers, and was the soul of all the councils. He was consulted, too, upon points of law as well as of theology. Besides this, he found time to attend to political affairs in the name of the Republic; to publish a multitude of writings in defence of his opinions, of which his commentaries on the Bible are the most important; and to maintain a correspondence through all Europe, but principally in France, where he laboured incessantly to extend the new doctrine. Besides his printed sermons, the library of Geneva contains 2025 in manuscript, and, like that of Berne, several theological treatises not printed. Although Calvin differed from Luther in essential points, yet his adherents were not distinguished from the Lutherans in the edicts of Francis I. and Henry II., nor even in the edict of Rouen in 1559. They themselves, indeed, regarded Calvin as their head, but without considering themselves as different, on this account, from the adherents of Luther. A formal separation first took place after the *colloquium* (conference) of Poissy in 1561, where they expressly rejected the tenth article of the Confession of Augsburg, besides some others, and took the name of *Calvinists*.

Calvin died May 27, 1564, in the fifty-fifth year of his age. He was of a weak constitution, and suffered from frequent sickness. In Strasburg he had married a widow, Idelette de Burie, in 1539: a son, the fruit of their union, died early. In 1549 he lost his wife, after which he never married again. He was temperate and austere, gloomy and inflexible. He knew nothing of friendship, and had no other passion than to establish the opinions which he believed to be correct. His disinterestedness was rare. He had a yearly stipend of 150 francs, 15 measures of corn, and 2 casks of wine: he never received a larger one. The value of the whole property which he left in books, furniture, money, &c., did not exceed 125 crowns. His character was impetuous and impatient of contradiction. 'I have,' he writes to Bucer, 'no harder battles against my sins, which are great and numerous, than those in which I seek to conquer my impatience. I have not yet gained the mastery over this raging beast.' The tone of his controversies is always harsh, bitter, and contemptuous. He does not always succeed in concealing the feeling of his own superiority.

As a theologian, Calvin was equal to any of his contemporaries in profound knowledge, acuteness of mind, and, as he himself boasts, in the art of making good a point in question. As an author, he merits great praise. His Latin works are written with much method, dignity, and correctness. He was also a great jurist and an able politician. But all these qualities would not have been sufficient to make him the head of a distinct religious sect, had he not boldly rejected all religious ceremonies. By this means he gained, on the one side, the highly cultivated, who were induced to look upon visible forms in religion as something derogatory, and also gave the uneducated an easy means of distinguishing themselves from the opposite party, without the necessity of examining the grounds of their faith, for which they were neither inclined nor qualified.

The chief doctrines of Calvin's system are those which were discussed at the famous synod of Dort, under the following heads; *predestination*, *particular redemption*, *total depravity*, *irresistible grace*, and *the certain perseverance of the saints*. In succeeding controversies, these were denominated the *five points*. The doctrine of *original sin*, often set forth as peculiar to Calvin's system, is common to those of many Protestant sects. The followers of Calvin in Germany are called the *Reformed*, but the doctrine of predestination is said to be losing ground in that country. In France, it is well known, most Protestants are Calvinists. Calvinism is the professed belief of the greatest part of the Presbyterians, both of Europe and America; the Particular Baptists in England and India, and the Associated Baptists in America; the Independents of every class in England and Scotland, and the Congregationalists of New England. The works of Calvin were first collected in the Geneva edition of 1617, in twelve vols. folio. The most complete is that published at Amsterdam in nine vols. folio, in 1671. The collected works of Calvin have been published in English by the Calvin Translation Society of Edinburgh, in fifty-two vols. 8vo, completed in 1855. A critical edition of his collective works has been published in Germany by Baum, Cunitz, and Reuss (Brunswick, 22 vols. 1863-81).

CALVINISM. See the preceding article and the articles Reformation, Reformed Church.

CALX, properly lime or chalk (hence *calcareous earth*); but the term is more generally applied to the *residuum* of a metal or mineral which has been subjected to violent heat, burning or calcination, solution by acids, or detonation by nitre, and which is, or may be, reduced to a fine powder. Metallic calces are now called *oxides* see Oxygen.

CALYDON, an ancient city of Ætolia, celebrated in the stories of King Œneus, the Calydonian boar, and Dejanira and Hercules. Œneus, as the fable runs, had forgotten Artemis in a solemn sacrifice offered to all the gods; that goddess in revenge sent a terrible boar, which laid waste the fields and gardens. In order to slay this monster, Meleager, the son of Œneus, solicited the aid of the boldest heroes of Greece—Theseus, Jason, Nestor, &c. Several of the assailants perished. Meleager finally pierced him in the back with his javelin, and the others speedily despatched him. The animal's skin was given to Atalanta. See Meleager.

CALYMENE, a genus formed by M. Al. Brongniart, and belonging to the fossil order of the Trilobites. In this genus the head is almost semicircular, and deeply divided by longitudinal furrows. The eyes are situated on the lateral lobes. The rings of the thorax and abdomen are difficult to distinguish from each other. The thoracic segments are from ten to fourteen in number. The abdominal rings are distinct and never attached to each other. The genus includes about twenty species, of which the *Calymene Blumenbachii* may be taken as the type. It is found in certain strata of the Silurian formation, at Dudley and in Gothland, Bohemia, and Ohio. The members of this genus have the power of rolling themselves up like a ball.

CALYPSO, in mythology, a daughter of Atlas (some say of Nereus and Doris, or of Oceanus and Thetis). She inhabited the woody island Ogygia, situated deep in the ocean, and lived remote from all intercourse with gods and men. Ulysses having suffered shipwreck on her island, she received him kindly, and promised him immortality if he would consent to marry her, but his desire of beholding his country and his wife overcame the charms of the goddess. Seven years he had to remain with her. Hermes finally brought Calypso the command of Zeus that Ulysses should be permitted to return to his home. This command she dared not oppose. Ulysses departed, but Calypso, who had borne him two children, Nausinous and Nausithous, died of grief. This subject has been wrought up in many different ways.

CALYPTRÆA, a genus of gasteropodous Mollusca, belonging to the family of the Calyptræidæ, which is arranged in Woodward's system in the order of the Prosobranchiata, which have the branchiæ or gills situated in advance of the heart, and the division Holostomata, which have the margin of the shell-aperture entire. This genus consists of small marine shell-fish, conical in form, but sometimes very flat; they are fragile, and are distinguished by a conical shell or testaceous process attached to the bottom of the cavity of the shell. The branchiæ of this mollusc are composed of long and thin hair-like filaments. Only two species are found in our waters. It is sometimes found as a fossil.

CALYX. See BOTANY.

CAMAIEU, or CAMEO, a painting wherein there is only one colour, and where the lights and shades are of gold, wrought on a golden or azure ground. When the ground is yellow the French call it *cirage;* when gray, *grisaille*. This kind of work is chiefly used to represent bass-reliefs. The Greeks call pieces of this sort *monochrōmata*. The word is also applied to a painting in two or three different colours, which, however, do not represent the natural colours of the objects depicted.

CAMALDOLITES, CAMALDULIANS, or CAMALDUNIANS, hermits and monks of the order established in 1012, by St. Romuald, a Benedictine of Ravenna, in the valley of Camaldoli, near Arezzo, in the Apennines, and confirmed afterwards by Pope Alexander II. They were originally hermits, living in separate cells, but as their wealth increased, the greater part of them associated in convents. They existed in Italy, France, Germany, and Poland. In the eighteenth century there were five independent fraternities of them, which are here mentioned in the order of their foundation:—1, at Camaldoli; 2, at Murano in the Venetian territory; 3, on Monte Corona, near Perugia; 4, at Turin; 5, the French fraternity, the first establishment of which was that of Notre Dame de la Consolation. White garments, and the austere rules of the Benedictines they all had in common. The hermits wore beards, and had still more severe rules in regard to fasting, silence, and penances. Their life was devoted to contemplation rather than to usefulness. There is, in the vicinity of Naples, a mountain which takes its name from a convent of the Camaldoli, situated on its top, from which the traveller enjoys a prospect of remarkable grandeur and beauty. It is one of the most charming of all the beautiful views around Naples; yet the spot is not much visited by travellers.

CAMARGUE, or CAMARQUE, LA, a piece of land insulated by the two principal mouths of the Rhone, sometimes called the Delta of France.

CAMARILLA, a word first used in Spain, but now in other countries also, to express the influence of certain persons in obstructing the operation of the official organs of government. When Ferdinand VII., in 1814, returned to Spain, he was surrounded by flatterers, who prevailed upon him to violate his promise of giving the people a constitution. They were called camarilla, either from the room where they remained in waiting, or in allusion to the Council of Castille (*camara de Castilla*). Until the revolution of 1820 (see SPAIN) the camarilla consisted mostly of men without talent, but passionately opposed to everything new; but when the king recovered his power in 1823 they became more influential and have since repeatedly interfered with the ministers. The thing itself is old enough: priests, favourites, and women have often formed camarillas in monarchies and other governments. The word was much used in France during the reign of Charles X., as its Spanish origin suggests the influence of priests, which was also great at that time in France.

CAMARINES, NORTH and SOUTH, two provinces of the Philippines, forming the S.E. limit of the island of Luzon. They have a finely diversified surface, but are very mountainous, particularly towards the E. and S., where several lofty volcanic peaks appear and give visible proofs of activity. One of them, which is continually emitting smoke and flame, is well known to mariners coming from the E., and forms a kind of natural lighthouse. The most important product is rice.

CAMBACÉRÈS, JEAN JACQUES RÉGIS, Duke of Parma, Prince and Arch-chancellor of the French empire, member of the Institute, born in 1753 at Montpellier, of an ancient *famille de robe* (family of lawyers). His zeal and talents soon obtained him distinction, and the office of a counsellor at the *cour des comptes* at Montpellier. At the beginning of the revolution he received several public offices, became in September, 1792, a member of the Convention, and laboured in the committees, particularly in the committee of legislation. Dec. 12, 1792, he was commissioned to inquire of Louis XVI. whom he desired for his counsel, and it was on his motion that the counsel was allowed to communicate freely with the king. In January, 1793, he declared Louis guilty, but disputed the right of the Convention to judge him, and voted for his provisory arrest, and in case of a hostile invasion, death. On the 24th of January he was chosen secretary of the Convention. As a member of the committee of public safety he reported, in the session of March 26, the treason of Dumouriez. In August and October, 1793, he presented his first plan for a civil code, in which his democratical notions were displayed. He was a member of the Council of the Five Hundred, where he presented a new plan for a *code civil*. This *Projet de Code Civil*, 1796, became subsequently the foundation of the *Code Napoléon*. May 20, 1797, he left his seat in the council. A year afterwards he appeared among the electors of Paris; and after the revolution of the 30th Prairial, VII. (19th of June, 1799), he was made minister of justice. On the 18th of Brumaire he was chosen second consul, and in that office made the administration of justice the chief object of his attention. After Napoleon had ascended the throne, Cambacérès was appointed arch-chancellor of the empire, and after obtaining many high distinctions, became in 1808 Duke of Parma. During the campaign against the allied powers in 1813, Cambacérès was made president of the council of regency. At the approach of the allies in 1814 he followed the government to Blois, and from that place sent his consent to the abdication of the emperor. When Napoleon returned in 1815 Cambacérès was again made arch-chancellor and minister of justice, and subsequently president of the chamber of peers. After the second fall of Napoleon he was banished, but in 1818 was permitted to return. He died, March 8, 1824.

CAMBAY, a seaport of Hindustan, Bombay Presidency, the chief town of a native state of the same name, at the head of the Gulf of Cambay, 85 miles N.N.W. of Surat. It was once a place of importance, but owing to the silting-up of the harbour, has greatly fallen off. The tides rush in with great violence, and rising from 30 to 40 feet, enable the largest vessels to approach the shore; but again, at ebb, leave them dry. Among the buildings are several mosques and Hindu temples, and many religious structures of the Jains. The natives are expert jewellers and goldsmiths, and agate, cornelian, and onyx ornaments are exported. The trade is chiefly in grain shipped to Bombay. Pop. (1891), 31,390. The state has an area of 350 square miles, and a population of 89,722.

CAMBERWELL, a parl. borough and suburb of London, S. side of the Thames, in Surrey, between Lambeth and Deptford. Its three divisions, North Camberwell, Peckham, and Dulwich, each return one member. Pop. in 1891, 255,719. See LONDON.

CAMBERWELL BEAUTY, the common English name of the *Vanessa Antiopa*, a large and beautiful butterfly found in Britain, but much more common on the continent of Europe and in North America. It measures three inches or more between the extremities of its extended wings, which are of a dark-brown colour, with a broad light-yellow border, and a row of blue spots near the edge. The caterpillar feeds on the leaves of the birch, willow, and poplar. When fully grown the caterpillar is black, with bright-red spots along the back, and small spines over the whole body.

CAMBIUM, in botany, the layer of delicate thin-walled cells which separates the wood from the bast in a great many stems and in a cross section appears as a ring. The growth of the stem takes place by the deposition on the outside of the wood of new wood-layers formed from the cambium, and on the inside of the bast of new layers of bast formed from the outer cells of the cambium layer. In conifers and dicotyledonous woody perennials the primary bundles are arranged in a circle, and their cambium layers are thus made to form a more or less continuous ring of cambium in the stem. By the deposition of new layers of wood and bast regularly taking place, especially in spring, at the inner and outer surfaces of this cambium-ring, the stem is caused to increase in thickness.

CAMBODIA, or CAMBOJA, a country in Asia, in the Indo-Chinese Peninsula; bounded N. by Siam, E. by Anam, S. by French Cochin-China and Gulf of Siam, and W. by Gulf of Siam. Its length from north to south is 240 miles, east to west 180, the area being 46,000 square miles. Pop. estimated at 1,500,000. The greater part of the region is low and flat and watered by numerous streams, the chief of which is the Mekong. The climate presents a dry and a wet season (June to November) and is fairly healthy. The soil is very fertile, producing large quantities of rice, besides maize, sugar-cane, cotton, betel, tobacco, indigo, coffee, &c. Timber is abundant. Gold and precious stones are found, besides iron, limestone, &c. Cattle are exceedingly numerous. Among wild animals are the elephant and the tiger. The Cambodians were formerly a highly cultured and civilized race. Various architectural remains, witnessing to former greatness, are found throughout the country. The present population is very mixed. In early times Cambodia was a powerful state to which even the kings of Siam paid tribute, but it gradually fell into decay, until about the close of the eighteenth century the Siamese annexed part of Cambodia to their own land, and reduced the rest of the country to a state of dependency. In 1863 Cambodia passed under the protection of the French, and by a decree of 1887 it was placed among the Indo-China possessions of France under a resident-general. The only towns of importance are Pnom-penh, the capital, and the seaport of Kampot. The chief imports are salt, sugar, wine, and various manufactured goods, such as textiles and arms; the exports include salt-fish, cotton, tobacco, rice.

CAMBODIA, or MEKONG, a large river of south-eastern Asia which rises in Tibet, passes through Yunnan, a province of China, Laos, Anam, Cambodia, and French Cochin-China, and falls into the Chinese Sea by several mouths, after a course of about 2600 miles. Its navigation is much interrupted by sand-banks, rapids, &c., at various points of its middle and upper course. The lake Tonlé-sap, on the frontiers of Cambodia and Siam, is connected with the Mekong.

CAMBORNE, a neatly built market town of England, in Cornwall, 11 miles N.W. of Falmouth, prettily situated on the slope of a gently rising hill. There is a granite church in the Perpendicular style, restored in 1862, and there are also several other places of worship. It also contains a market hall, a mining school, a working-man's institute, and a museum of mineralogy. Near it are tin and copper mines. Pop. in 1891, 14,700; in 1901, 14,726.

CAMBRAI, (Flemish *Kambryk*), a fortified city of northern France, on the Scheldt, in the department Nord, 45 miles south of Lille. From this place the linen cloth known by the name of *cambric* got its name. Cambrai is the seat of an archbishop. The revolution stripped it of all its principal ornaments. The beautiful cathedral and the tomb of its archbishop, the celebrated Fénelon, were razed to the ground. There is a new monument to the memory of Fénelon in the present cathedral, a modern building of indifferent architecture. There is a large and handsome modern Hôtel de Ville, and an ancient belfry tower. Cambrai is the seat of a diocesan seminary, communal college, &c. It has a public library with 40,000 vols. and 1400 MSS. Cambric and other linen goods, cotton, lace thread, leather goods, sugar, soap, beer, &c., are manufactured; and there is a trade in grain, oil-seed, hemp, &c. Cambrai is the *Camaracum* of the Romans. In 1508 the league against Venice was concluded at Cambrai between the Emperor Maxmilian, Louis XII., the Pope, and Ferdinand of Aragon; in 1529 the peace with Charles V. (See FRANCIS I.) Louis XIV. took Cambrai from the Spaniards in 1677, and it was finally confirmed to France by the treaty of Nijmegen in 1678. Pop. (1896), 25,250.

CAMBRIA, a Latin name of Wales, derived from Cymri, the name of the branch of the Celts to which the Welsh belong, and the name which they always give to themselves.

CAMBRIAN FORMATION, the name given to a series of rocks of great aggregate thickness, developed largely in North Wales, and examined with great care by Professor Sedgwick. See GEOLOGY.

CAMBRIC, a fine thin kind of linen cloth manufactured originally, it is said, at Cambrai in French Flanders (see CAMBRAI), whence the name. Cambric is manufactured in the north of Ireland, in England, Switzerland, and France, and is now chiefly used for handkerchiefs. The name is also applied to a cotton fabric, which is in reality a kind of muslin.

CAMBRIDGE, an inland county of England, bounded on the N. by the county of Lincoln; on the W. by Northampton, Huntingdon, and Bedford; on the S. by Hertfordshire and Essex; and on the E. by Suffolk and Norfolk. The boundaries are much indented and mostly artificial. A great part of northern half of the county belongs to the fen district and is very flat, farther south it is undulating, and in the south-east some heights occur. The soil is considerably diversified; much of that of the fens is a strong black earth on a gravelly bottom. The uplands consist of chalk, gravel, loam, and clay. The principal rivers are the Cam or Granta, and the Ouse, with the Nen in the north. The Cam has two main branches which unite about 3 miles above the town of Cambridge, passing which it flows onwards to join the Ouse about 3½ miles from Ely. The Ouse enters the county from Huntingdon a little to the N.E. of St. Ives, and traverses it in a north-easterly direction into Norfolk. An important portion of the county, including the Isle of Ely, belongs to the great artificially drained tract known as the Bedford Level (which see), which, instead of fen and waste land, now consists of good arable and pasture land. About nine-tenths of the total acreage of the county is now productive, and a greater proportion of land is under corn crops than in any other county in the kingdom. The total area in statute acres is 553,251, of which about 490,000 acres are under rotation crops and permanent pasture, about 100,000 acres being under wheat, and 118,000 in permanent pasture. Potatoes, turnips, and mangold are the chief green crops. The southern portion of the county is the most pleasant, especially the district watered by the Cam, which abounds in dairy farms, celebrated for the production of excellent butter and cheese. The part of the county extending from Gogmagog Hills to Newmarket, being bare and heathy, is chiefly appropriated to sheep-walks. The chief mineral productions are the phosphatic nodules known as coprolites, lime, and clay for brick and tiles; and peat is cut for fuel. Cambridgeshire sends three members to the House of Commons. The Isle of Ely in some respects forms a separate county. Pop. in 1881, 185,594; in 1901, 190,687.

CAMBRIDGE, a municipal and parl. borough, capital of the above co., situated on the river Cam, 50 miles N. of London. It is an ancient place, and was a Roman station. In 871 the Anglo-Saxon town was burned by the Danes, and again in 1010. A castle was erected here by William the Conqueror. Cambridge received some valuable privileges from Henry I. In the reign of Richard II., who held a parliament here, great disputes took place between the authorities of the town and university, which ended in the former losing many of their privileges, and the corporation was not fully restored until the reign of Henry VIII. In 1630 the plague raged here with great violence, so that the students were driven from the university. The greater part of Cambridge occupies a level area encompassed by the colleges and their beautiful grounds and gardens on both sides of the Cam, which is crossed by nine bridges. Several of the streets are narrow and winding, but others are spacious and airy, and much improvement has taken place of late years. The town possesses a guildhall, fine county hospital, free library, and one or two interesting old churches, especially St. Benedict's, with a tower in the Saxon style of architecture, and the round church of the Holy Sepulchre. It is the university, however, that gives Cambridge its importance, and the colleges and university buildings comprise many fine specimens of architecture. We may specify King's College, with its splendid chapel in the Perpendicular style, Trinity College (the largest in the university), Queen's College, Jesus College, St. John's College and chapel (1869), Gonville and Caius College; the Fitzwilliam Museum, university library, senate house, divinity school, the Pitt Press, &c. The parish church of Great St. Mary's serves as the university church, and there is a handsome Roman Catholic church. A post-graduate Presbyterian college was opened in 1899. There is also a grammar-school. Cambridge is the birthplace of Jeremy Taylor, and of Richard Cumberland the dramatist. The town sends one member to Parliament. Pop. in 1861, 26,361; in 1891, 36,983; in 1901, 38,393.

CAMBRIDGE, UNIVERSITY OF. The origin of this learned foundation is involved in obscurity. Until the twelfth century we find no annals of the university that can be trusted. Henry III., in 1231, issued writs for the regulation of Cambridge 'clerks', and makes mention of a chancellor and masters. In 1334 King Edward III. granted the university some important privileges; and in 1430 Pope Martin V. invested it with exclusive ecclesiastical and spiritual jurisdiction over its own scholars. In the reign of Elizabeth further privileges and rights were bestowed on it, and all preceding grants were confirmed. The university in its corporate capacity is referred to as consisting of the chancellor, masters, and scholars. The university buildings now consist of seventeen colleges and one public hostel, the Fitzwilliam and other museums, university library, senate-house, laboratories, &c. (See preceding article.) The following list contains the name of each of the colleges, and the time when it was founded:—

1.	St. Peter's College, or Peter House	1284
2.	Clare College, formerly Clare Hall	1326
3.	Pembroke College	1347
4.	Gonville and Caius College	1348
5.	Trinity Hall	1350
6	Corpus Christi College	1352
7.	King's College	1441
8.	Queen's College	1448
9.	St. Catharine's College, or Catharine Hall	1473
10.	Jesus College	1496
11.	Christ's College	1505
12	St. John's College	1511
13.	Magdalene College	1519
14.	Trinity College	1546
15.	Emmanuel College	1584
16.	Sydney Sussex College	1596
17.	Downing College	1800

Each of these colleges (as also Selwyn College, the public hostel, founded in 1882) is a separate corporation, governed by laws and usages of its own, although subject to the paramount laws of the university. There are eight separate orders in the several colleges, which are:—1. The head, who is styled Master in all the colleges except King's and Queen's, in the former of which he is styled Provost, and in the latter President. 2. Fellows, who are graduates, and upon the foundation of the college to which they belong. They receive an annual allowance from the college funds, the average amount of which varies from about £150 to £250, the latter sum being latterly fixed as the maximum. The number of fellowships varies considerably at the different colleges, some having less than twelve, and others from fifty to sixty. The tenure of a fellowship is generally limited to six years; but it may be prolonged under certain conditions. The total number of fellowships is about 400. 3. Noblemen graduates, doctors in the several faculties, Bachelors in Divinity, Masters of Arts, Masters of Law, and Masters of Surgery, who are not upon the foundation. 4. Bachelors of Arts, Law, Medicine, and Surgery. 5. Fellow-commoners, who are generally the younger sons of the nobility, or young men of fortune, and have the privilege of dining at the fellows' table. 6. Scholars who are elected by direct examination or otherwise from the most distinguished among the undergraduates. Like the fellows they receive an annual allowance from the college funds, but it is not so large in amount, and the tenure is shorter. 7. Pensioners, who form the great body of the students. 8. Sizars, students of limited means, who receive various emoluments. In addition to these there is a class of students called minor scholars or exhibitioners, who do not properly form a separate order, but are ranked along with the pensioners or general body of students. These also receive a certain annual allowance. The undergraduates (numbering (3016 in 1899) reside either in rooms belonging to their respective colleges, or in lodgings approved by the university authorities, and under strict rules, at least so far as those in *statu pupillari* are concerned. Except a certain number of non-collegiate students they all belong to some particular college. The head of each college and the foundation fellows together form the governing body.

The university is composed of a chancellor, vice-chancellor, the masters or heads of colleges, fellows of colleges, and students, amounting in all (in 1899) to 13,413 members, and is incorporated as a society for the study of all the liberal arts and sciences. The present statutes, which are based upon the older ones, given by Queen Elizabeth, were drawn up by the Universities' Commission appointed in 1877, and were approved by the Queen in council in 1882. The government is administered by a chancellor, who is generally a nobleman; a high steward; a vice-chancellor, who is the head of some college; two proctors, who attend to the discipline of all persons *in statu pupillari*, read the 'graces' or decrees of the senate, &c., the assessor, moderators (who examine for mathematical degrees), a commissary, a public orator, &c. The senate, which is composed of all who have taken the degree of Doctor or Master, is the great legislative assembly of the university. The legislative propositions which are passed by this assembly are called 'graces,' and these possess generally the force of statutes, provided they are not inconsistent with the original statutes. In 1899 the number of members of senate was 6995. The council of the senate consists of the chancellor, vice-chancellor, four heads of colleges, four professors, and eight other members of the senate chosen by the resident members of the senate and examiners, whose names appear on the electoral roll published annually by the vice-chancellor. Every university grace must be approved by this council before it is offered to the senate.

There are three terms at this university, which are fixed by invariable rules. They are:—Michaelmas, or October term, which lasts from the 1st of October to the 19th of December; Lent, or January term, which begins on the 8th of January, and lasts till within a few days of Easter; and Easter, or Midsummer term, beginning three weeks after the end of the Lent term, and ending on the 24th of June. Every student must have completed nine terms' residence during three-fourths of each term before he can take the degree of B.A., LL.B., M.B., or B.C., for which, accordingly, a residence of three years is required. A Bachelor of Arts, Law, or Surgery may be admitted 'Inceptor' at any time after three years from the completion of his bachelor's degree, and Inceptors in every year become complete Masters by creation on Commencement-day, *i.e.* the day on which the degrees conferred during the year are completed: it is the Tuesday immediately preceding the last day of the Easter Term. Bachelors of Arts may obtain 'honours' in the departments—Mathematics, Classics, Moral Sciences, Natural Sciences, Law, History, Theology, Semitic Languages, or Indian Languages. The successful candidates in each of these departments are arranged in a tripos, that is, in three grades. In the mathematical tripos these three grades are called respectively Wranglers, Senior Optimes, and Junior Optimes; in the other triposes they are called first, second, and third class. Other degrees conferred by the university are those of Doctor and Bachelor of Divinity, Doctor of Law and of Medicine, and Doctor and Bachelor of Music; while by the new statutes, graduates of distinction in Science or Letters may be created Doctor in Science or in Letters, respectively. Since the passing of the University Tests Act (34 and 35 Vict. cap. xxvi.) any person may take any lay academic degree, or hold any lay academic or collegiate office without subscribing any formulary of faith. Purely honorary degrees may be conferred without residence or examination, or exercises, on privy-councillors, bishops, noblemen, or the sons of noblemen, deans of cathedrals, and heads of colleges, or upon any persons of eminent station or conspicuous merit; but no one who has received a degree in this way is entitled to a vote in the senate unless he has resided three terms at the university. Women who have fulfilled the conditions of residence and standing which members of the university are required to fulfil, may be admitted to the tripos examinations. Those who pass are placed in the published lists, and receive certificates; but no degrees are conferred upon them. Two colleges (Girton and Newnham) have been established for women within the precincts of the university, and many of the university lectures are open to students of these colleges.

The annual income of the university is about £60,000 (1898), arising from various sources, including the produce of fees at matriculations, for degrees, &c., and the profits of the university press; and from a tax assessed upon the incomes of the colleges. The professors are paid, some from the university chest, and others from estates left for that purpose. There are about forty professors in the various departments of literature and science. The languages, arts, sciences, &c., taught by the professors are Anglo-Saxon, Arabic, anatomy, archæology, astronomy, geometry, botany, moral philosophy, chemistry, divinity, laws of England, geology, Greek, international law, Latin, Hebrew, Sanskrit, political economy, modern history, civil law, mathematics, mechanism, medicine, mineralogy, music, natural philosophy, physic, physiology, zoology, fine arts, &c. There is besides a body of university tutors, readers, lecturers, and demonstrators, who supplement the work of the professors. The botanic garden, on the S.E. side of the town, occupies between three and four acres. The anatomical school contains a large collection of valuable preparations. On an eminence, at the distance of 1 mile from the college walks, on the road to Madingley, stands the observatory, which cost £19,000. The university library contains more than 500,000 printed volumes, besides many valuable manuscripts (among them the *codex Bezæ*). The New Museums and laboratories for the study of the natural sciences are amoung the most complete in the country. The Cavendish Laboratory especially is admirably contrived and furnished for the pursuit of experimental physics. The school of mechanical science, fitted with elaborate apparatus, offers a complete training in various branches of engineering. The Fitzwilliam museum contains a noble collection of books, paintings, drawings, statuary, &c. The university sends two members, elected by the senate, to Parliament. The vice-chancellor is the returning officer.

CAMBRIDGE, a city of Middlesex county, Massachusetts, on the N. side of Charles River, which separates it from Boston. Pop. in 1890, 70,028. Cambridge consists of four principal parts or divisions, namely, Old Cambridge, which contains the university, a state arsenal, &c.; Cambridge-port, containing the city-hall, and connected with Boston by West Boston Bridge; East Cambridge, a flourishing manufacturing locality, situated on Lechmere Point, connected with Boston by Craigie's or Canal Bridge; and North Cambridge, forming a residential district. This town is one of the oldest in New England, having been founded in 1630. The university, the oldest in the United States, was endowed by a bequest of the Rev. John Harvard, in 1638, and hence named Harvard College. Its endowments have been since greatly increased by numerous acts of private bounty, as well as by a few donations from the state; and with regard to funds, library, professorships, and literary advantages in general, it is the first institution of the kind in America. Besides the original academic foundation for students in arts, there are seven professional schools affiliated to Harvard College, viz., one each for medicine, law, theology, science, dentistry, veterinary science, and agriculture. All of these are in Cambridge except the dental and veterinary schools, which are in Boston. A number of the college buildings, including lecture-halls, rooms for the students to live in, library, chapel, &c., are arranged round a square of fifteen acres, others being scattered about elsewhere. Perhaps the finest of the university buildings is the Memorial Hall, dedicated to the memory of alumni who lost their lives in the civil war. It has a tower 200 ft. high, and contains a dining-hall that can accommodate about 700 persons at table, and is adorned with numerous portraits. The library, one of the largest in the Union, contains upwards of 250,000 volumes, while other libraries bring up the total number of books to about 400,000. The Agassiz museum of comparative zoology is one of the foremost institutions of this kind; the Peabody museum of American archæology and ethnology is very complete; the philosophical apparatus is probably not surpassed by any in the country; and the chemical laboratory and cabinet of minerals are also valuable. The botanic garden is furnished with an interesting collection of trees, shrubs, and plants, both native and foreign. The government is intrusted to two separate boards, one consisting of the president, the treasurer of the university, and five fellows, the other of the overseers. With the first board lies the appointment of the professors, tutors, &c., and it has also the right of supplying all vacancies in its own body; but all its decisions are subject to the approval of the other board. This second board was formerly composed of the governor and lieutenant-governor of the state, the president and treasurer of the university, and certain preachers, all *ex officio*, besides thirty non-official members chosen by the state legislature, but in 1865 all official connection between college and state was broken by the passing of an act according to which the board is now elected by the alumni. The educational staff is very numerous, consisting of over eighty professors, besides assistants, lecturers, &c. The course of education requisite to obtain the first art degree (bachelor), as in American colleges generally, is completed in four years. Before students can be admitted they must have attained a somewhat high degree of proficiency in classical and other studies, and thus the age of those entering is usually not under eighteen. In the theological school, which was organized in 1815, the course of education may be completed in three years. The law school was established in 1817. Students in this department complete their education in three years. The medical college was organized in 1782. A four years' course qualifies a student for the degree of doctor of medicine. The school of science was instituted in 1848, mainly through the efforts of the Hon. Ascott Lawrence. It is intended for those who wish to qualify themselves for practical pursuits without going through a regular classical course. There are many scholarships and prizes attached to the various departments. No fees are paid directly to professors; a payment of 150 dollars per annum secures instruction in the arts and certain other departments, and 200 dollars in medicine. There is an institution (the Harvard 'annexe') in which women receive instruction corresponding to that of the male students, from the professors and lecturers of the university.

CAMBRIDGE MANUSCRIPT, or BEZA'S MANUSCRIPT, a copy of the Gospels and Acts of the Apostles in Greek and Latin. Beza found it in the monastery of Irenæus at Lyons, in 1562, and gave it to the University of Cambridge in 1582. It is a quarto, and written on vellum. Sixty-six leaves of it are much torn and mutilated, and ten of these are supplied by a later transcriber. The age of this MS. is differently estimated by different writers, but all agree that it is of great antiquity. The most competent judges consider it one of the most ancient. In the Greek it is defective from the beginning to Matthew i. 20; in the Latin, to Matthew i. 12; besides which it has some other chasms. Wetstein, Griesbach, Michaelis, and several others, have written upon this MS. An exact copy of this manuscript, printed in ordinary type, was published in 1864, edited by F. Scrivener, who furnished it with a critical introduction, annotations, and facsimiles.

CAMBYSES.—1. A Persian of noble blood, to whom, according to the account given by Herodotus, King Astyages gave his daughter Mandane in marriage, in order to prevent the fulfilment of a dream, according to which he was to lose his crown by means of his daughter's son, while he flattered himself with the hope that his grandson would constantly hold in remembrance the benefit conferred on his father. He did not, however, escape his fate, for Cyrus, the son of Mandane, dethroned him.——2. The son of Cyrus the Great and of Cassandane, and grandson of the preceding, became, after the death of his father, King of the Persians and Medes, B.C. 529. In the fifth year of his reign he made an attack upon Egypt, killed the king of this country, Psammenitus, plundered the chief city Memphis, and conquered the whole kingdom within six months. He now wished to send a fleet against Carthage, to conquer Æthiopia, and to obtain possession of the temple of Jupiter Ammon. The first of these expeditions, however, did not take place, because the fleet, which was manned with Phenicians, refused obedience to him. The army which was sent against the Ammonites perished in the desert; and the troops, at whose head he himself had set out against the Æthiopians, were compelled by hunger to retreat. From this time he gave himself up to the greatest cruelties. On his entrance into Memphis, seeing the Egyptians engaged in the celebration of a feast in honour of their god Apis, whom they had found, he believed that they were rejoicing at his misfortunes. He caused the holy bull to be brought before him, slew him with his own sword, and caused the priest to be scourged with rods. To drown his remorse he indulged himself in the most immoderate enjoyment of wine. No relation was held sacred by him when intoxicated. He caused his brother Smerdis, a dream concerning whom had disturbed him, to be murdered. His sister and wife Atossa, who lamented the death of Smerdis, he killed with a blow of his foot. These and other acts, almost indicating insanity, had irritated his subjects. A magian availed himself of this discontent, and obtained possession of the throne under the name of Smerdis, whose death had been concealed. Cambyses had resolved to go to Susa, in order to punish him, when, as he was mounting his horse, he was wounded in the hip by his sword. He died of this wound soon after, in 521, at a place named Ecbatana, in Syria, without leaving any children. Such is the account of his life given by Herodotus, but somewhat different accounts are given by Ctesias and others.

CAMDEN, a town of the United States, capital of Camden county, New Jersey, on a plain, on the left bank of the Delaware, opposite Philadelphia, a river port and railway centre. It is laid out in regular streets, which cross each other at right angles, and possesses many fine buildings, including municipal buildings, court-house, numerous churches, schools, &c. The chief industrial establishments are iron-foundries, machinery works, cotton-mills, chemical works, steel pen manufactory, &c., and there are yards for ship-building. The communication with Philadelphia is kept up by means of steam ferries. Pop. (1890), 58,313.—There is another Camden in South Carolina, on the Wateree, which is there navigable. On Aug. 16, 1780, General Gates was defeated by Lord Cornwallis at this place. Pop. 4000.

CAMDEN, Charles Pratt, Earl of, a distinguished British lawyer and statesman of the 18th century, was the son of Sir John Pratt, chief-justice of the King's Bench, and was born in 1713. After studying at Eton and King's College, Cambridge, he entered as a student at Lincoln's Inn, and in due time was called to the bar. In 1754 he was chosen member of Parliament for the borough of Downton. After acquiring great reputation as an advocate, he was, in 1757, appointed attorney-general, having the same year been elected recorder of the city of Bath. While he held the office of chief-justice of the Common Pleas Wilkes was arrested on a general warrant, as the author of the North Briton, a periodical paper which gave offence to government. He was committed to the Tower as a state prisoner; and being brought, in obedience to a writ of Habeas Corpus, before the court of Common Pleas, Chief-justice Pratt discharged him from his confinement on May 6, 1763. The behaviour of the judge on this occasion, and in the consequent judicial proceedings between the printers of the North Briton and the messengers of the House of Commons, and other agents of the ministry, was so acceptable to the metropolis, that the city of London presented him with the freedom of the corporation, in a gold box, and requested to have his picture. In July, 1765, he was raised to the peerage, by the title of Baron Camden; and about a year after he was made lord-chancellor. In this capacity he presided at the decision of a suit against the messengers who arrested Mr. Wilkes, when he made a speech, in which he stated that 'it was the unanimous opinion of the court, that general warrants, except in cases of high treason, were illegal, oppressive, and unwarrantable.' On his opposing the taxation of the American colonies, he was deprived of the seals in 1770. He came into office again as president of the council, under the administration of the Marquis of Rockingham, in March, 1782; on whose death, he resigned the following year. He soon after, however, resumed his place under Mr. Pitt, and, in 1786, was made Earl Camden. He died April 18, 1794.

CAMDEN, William, a celebrated antiquary and historian, was born in London in 1551. He received part of his education at Christ's Hospital and St. Paul's School, after which he studied at Oxford. In 1575 he was appointed second master of Westminster School, through the patronage of Dean Goodman. He devoted himself faithfully to the duties of his situation, employing all his leisure in his favourite study of British antiquities. At this time he began to make collections for his great work, the Britannia. In 1582 he travelled through the eastern and northern parts of England, to survey the country, and arrange a correspondence for the supply of further information. The result of his researches appeared in 1586, when the first edition of his Britannia was published in Latin, in an octavo volume, with a dedication to Lord Burleigh. This work, though at first necessarily imperfect, procured the author high reputation at home and abroad. In 1589 and 1590 he went into Wales and the w. of England, and obtained materials for the improvement of his book, of which the fourth edition (1594) was enlarged to a quarto volume. In 1593 he succeeded Dr. Edward Grant as head master of Westminster, for the use of which seminary he drew up a Greek grammar, published in 1597. The same year he obtained the office of Clarencieux king-at-arms, which left him at leisure to cultivate his favourite branches of knowledge. In 1600 appeared the fifth edition of the Britannia, with a defence against some animadversions made on the work by Ralph Brooke, York herald, who was probably influenced by a jealousy of Camden, though many of his remarks were by no means destitute of foundation. In 1605 was published Remains of a Greater Work concerning Britain; and in 1607 appeared a narrative of the conspiracy called the Gunpowder Plot, written in Latin, by the king's command. The same year Camden published the last edition of the Britannia printed during his life, from which was made the English translation of Philemon Holland. After this he undertook to write the history of the reign of Queen Elizabeth, the principal literary labour of his future years. The first part of this work appeared in 1615, with the following title:—Annales Rerum Anglicarum et Hibernicarum regnante Elizabetha, ad annum salutis, 1589 (London, folio). The second part was finished in 1617, but not printed till after the death of the author. A complete edition of the Annals was published by Thomas Hearne at Oxford, 1717, three vols. 8vo. In 1622 Camden founded a professorship of history at Oxford, which he endowed with the valuable manor of Bexley in Kent. He died November 9, 1623, at Chiselhurst in Kent, where he had spent the latter part of his life. Besides the works already mentioned, Camden published a collection of early English historians, printed at Frankfort in 1603, folio. Hume, in his History of England, ranks Camden's History of Queen Elizabeth among the best historical productions which had been composed by any Englishman. Of the Britannia, which has for three centuries been considered as a standard work, it is unnecessary to say more than that as subsequently enlarged in Richard Gough's English edition of 1806, so as to extend to four volumes in folio, it constitutes a valuable treasury of British topography and antiquities. The Camden Society, which was established in London in 1838, and has issued a number of valuable works, was named in honour of this Camden.

CAMDEN TOWN, a district of London in the parish of St. Pancras, and county of Middlesex. The houses, which are in general of recent erection, are regular and substantial buildings. It lies north-east of Regent's Park and north of the Euston station of the London and N. W. Railway. Pop. 15,461.

CAMEL (*Camelus*, Linn.), a genus of mammiferous quadrupeds, of the ruminant order, characterized by their size; the possession of incisive, canine, and molar teeth; the upper lip divided; the neck long and arched; by the absence of horns, and by having one or two humps or protuberances upon the back, and naked callosities at the joints of the leg, the inferior part of the breast, &c. The inferior extremities terminate in two toes, which are not wholly covered by hoof, as they have only a small one at the extremity, and a sort of very hard, callous sole, common to both. There are six incisive and two canine teeth in the lower jaw; and in the upper there are two incisors in the intermaxillary bone, with one or two canine teeth on each side, which increase to a considerable size with the increasing age of the animal.

The native country of this genus is said to extend from Marocco to China, within a zone of 900 or 1000 miles in breadth. The common camel, having two humps, is only found in the northern part of this region, and exclusively from the ancient Bactria, now Turkestan, to China. The dromedary, or single-hump camel, is found throughout the entire length of this zone, on its southern side, as far as Africa and India. Notwithstanding this, the dromedary cannot sustain either the burning heat of the torrid, or the mild climate of the temperate zone, while the camel supports all the vicissitudes of climate with but little injury. It is highly probable that the camel has long ceased to exist in its wild or natural state, as it has been enslaved by man from the earliest times of which we have record. Among the stock composing the wealth of the patriarch Job we find 6000 camels enumerated. Unlike the elephant, and other animals which cease to breed in a state of captivity, the camel is as prolific as if at liberty; and vast numbers are raised and employed throughout the oriental countries, especially in the commerce carried on between the people residing in the vicinity of the great deserts. To these people the camel answers the place of ships and other modes of conveyance, being especially adapted by nature for the service in which it is employed. In regions where water is scarce, and wells or springs are several days' journey distant from each other, it would be impossible to traverse the country with the usual beasts of burden. During the season when fresh pasture is abundant camels can go for weeks without water, provided they are not loaded or required to make extraordinary exertions; the juices of the plants which form their food are then sufficient to quench their thirst. But during the dry season they cannot hold out nearly so long, but must be supplied with water about every fourth day. Some naturalists have held that this power of enduring thirst is due to the peculiar structure of the stomach of the camel. It is their opinion that the large cells which are found in the first two divisions of the stomach, and which some anatomists look upon as forming a fifth stomach, are destined to retain the water which the camels have drunk, so that it may be used by them when necessary. Other naturalists, and among them M. De Quatrefages, think that the water found in these reservoirs is really a secretion of the animal. The stories which are told of camels sometimes being slain by their drivers for the sake of the water contained in those cells must be received with considerable suspicion, for while some confidently assert the truth of those stories, others as expressly and confidently deny it. On the one hand Dr. Patrick Russell, who had long been resident in Syria, in his preface to the second edition of his brother Dr. Alex. Russell's Natural History of Aleppo, says—'That water, in cases of emergency, is taken from the stomach of camels, is a fact neither doubted in Syria nor thought strange.' He adds, however, that he himself was never in a caravan reduced to such an expedient. On the other hand Brehm, the German traveller and naturalist, states in his Illustrirtes Thierleben, the first two volumes of which were published in 1863–64, that he had himself asked many an old camel-driver in the desert if he had ever heard of such a thing being done, and not one of them knew anything of such a story. He says, too, that he has sometimes been present when the stomach of a camel was opened, and that the stench which proceeds from it is so intolerable that it would excite insuperable disgust, even in one who was almost perishing from hunger. Besides that, he says that there was no appearance of any water unmixed with the food of the animal.

Possessing strength and activity surpassing that of most beasts of burden, docile, patient of hunger and thirst, and contented with small quantities of the coarsest provender, the camel is one of the most valuable gifts of Providence. There is nothing, however, in the external appearance of the animal to indicate the existence of any of its excellent qualities. In form and proportions it is very opposite to our usual ideas of perfection and beauty. A stout body, having the back disfigured with one or two humps; limbs long, slender, and seemingly too weak to support the trunk; a long, slim, crooked neck, surmounted by a heavily-proportioned head, are all ill-suited to produce favourable impressions. Nevertheless there is no creature more excellently adapted to its situation, nor is there one in which more of creative wisdom is displayed in the peculiarities of its organization. To the Arabs and other wanderers of the desert the camel is at once wealth, subsistence, and protection. Their strength and fleetness render their masters the terror of enemies, and secure them from pursuit—a few hours being sufficient to place leagues of trackless desert between them and their foes. The flesh of the young animal is one of the greatest luxuries: of the skins tents are made; the various sorts of hair or wool shed by the camel are wrought into different fabrics; and its dried dung constitutes excellent fuel, the only kind, indeed, to be obtained throughout vast extents of country. In order to qualify camels for great exertions and the endurance of fatigue, the Arabs begin to educate them at an early age. They are first taught to bear burdens by having their limbs secured under their belly, and then a weight proportioned to their strength is put on: this is not changed for a heavier load till the animal is thought to have gained sufficient power to sustain it. Food and drink are not allowed at will, but given in small quantity, at long intervals. They are then gradually accustomed to long journeys and an accelerated pace, until their qualities of fleetness and strength are fully brought into action. They are taught to kneel, for the purpose of receiving or removing their load. When too heavily laden they refuse to rise; and by loud cries complain of the injustice. On long journeys the Arabian camel is loaded with 3 cwts. at the most, on short journeys it may be with 4 cwts. Such enormous burdens were sometimes put on the Egyptian camel, which is of a stouter make and stronger than the ordinary Arabian camel, that at one time the government thought it necessary to limit the burden to about 700 lbs. Those which are used for speed alone are capable of travelling from 60 to 90 miles a day. Instead of employing blows or ill-treatment to increase their speed, the camel-drivers sing cheerful songs, and thus urge the animals to their best efforts. When a caravan of camels arrives at a resting or baiting place, they kneel, and the cords sustaining the load being untied, the bales slip down on each side. They generally sleep on their bellies, crouching between the bales they have carried: the load is, therefore, replaced with great facility. In an abundant pasture they generally browse as much in an hour as serves them for ruminating all night, and for their support during the next day. But it is uncommon to find such pasturage, and they are contented with the coarsest fare: nettles, thistles, thorny shrubs, &c., being eaten by them with avidity, and even preferred to more delicate plants.

Camels designed exclusively for labour are usually gelded, and females are also treated in a similar manner. They are, it is true, not so strong nor so spirited as unmutilated animals, but are much more manageable. During their sexual season the males become furious and ungovernable; they refuse food, are spiteful, biting and kicking even their keepers, to whom they are at other times very obedient. At this time also a fetid secretion is effused from a glandular apparatus on the neck; the animal foams at the mouth, and a red, membranous vesicle is extended on each side of it. The female goes with young twelve months, and brings forth one at a birth. Her milk is very thick, abundant, and rich, but of rather a strong taste. Mingled with water, it forms a very nutritive article of diet. Breeding and milk-giving camels are exempted from service, and fed as well as possible, the value of their milk being greater than that of their labour. The young camel usually sucks for twelve months, but such as are intended for speed are allowed to suck and exempted from restraint for two or three years. The camel attains the full exercise of its functions within four or five, and the duration of its life is from forty to fifty years.

The humps or bunches on the back of the camel are mere accumulations of cellular substance and fat, covered by skin and a longer hair than that of the general surface. During long journeys in which the animals suffer severely from want of food and become greatly emaciated, these protuberances are gradually absorbed and no trace of them left, except that the skin is loose and flabby where they were situated. In preparing for a journey, it is necessary to guard the humps from pressure or friction by appropriate saddles, as the slightest ulceration of these parts is followed by the worst consequences; insects deposit their eggs in the sores, and sometimes extensive and destructive mortification ensues.

The Bactrian or common camel is larger than the dromedary; the limbs are not so long in proportion to the body; the muzzle is larger and more tumid; the hair of a darker brown; and the usual gait slower. A still more striking distinction is afforded by the two humps—the dromedary having but one. This single hump of the latter occupies the middle of the back, rising gradually on all sides towards its apex, and never inclining to one side. There is also a hybrid between the two species. Many breeds or races, varying considerably among themselves, also exist. Both species are commonly found in collections of animals. The dromedary is more frequently seen than the camel. In 1622 Ferdinand de' Medici II. introduced some camels into Tuscany, where they have ever since been reared. They are kept on a large sandy plain at San Rossore, near Pisa, where they live just as they do in their native country. In 1810 there were 170 of them; in 1840, 171; there are now about 200. Camels were introduced into the United States in 1857 for use in the sandy regions of the west, and there are now a considerable number of them there. They have also been used in Australia for exploration purposes and for carriage in the drier regions, and they are now bred with success there. In the recent military operations in the Soudan there was a camel corps—soldiers mounted on camels—in connection with the British forces.

During that season of the year when these animals become violent, the Turks in some places set on foot disgraceful camel-fights. The animals are muzzled to prevent their doing each other serious injury, for their bite is tremendous, always bringing the piece out. A couple being let loose run at each other with extreme fury. Their mode of combat is curious; they knock their heads together laterally, twist their long necks, wrestle with their fore-legs, almost like bipeds, and seem to be principally bent on throwing down their adversary.

CAMEL, a water-tight box or caisson used to raise a sunken vessel, or to float a vessel over a shoal or bar. It is let down with water in it, and is attached to the vessel, after which the water is pumped out and the camel rises from its buoyancy, load and all.

CAMELFORD, a village, formerly a parliamentary borough of England, county of Cornwall, on the Camel, 28 miles N.W. Plymouth. The streets are spacious and well-paved, but the houses are in general very indifferent. It has a town-hall, erected by the Duke of Bedford. Four miles to the N.W. of Camelford are the ruins of King Arthur's castle of Tintagel, and about 2 miles to the N. are the celebrated slate quarries of Delabole. The inhabitants are chiefly engaged in agriculture. It was disfranchised by the Reform Act of 1832. Previous to that period it sent two members to the House of Commons, and had done so from the time of Edward VI.

CAMELINA SATIVA (*gold of pleasure*), a cruciferous annual, belonging to the order of Brassicaceæ, and frequently found in cultivated fields in Great Britain, though supposed not to be a native. It is common on the Continent, where it has long been cultivated for its seeds, which contain much oil, sweet and edible when fresh, but apt to become rancid.

CAMELLIA, the name of a genus of plants belonging to the natural order Ternstrœmiaceæ, an order which includes the tea-plant and several species of beautiful flowering shrubs, all natives of China. The name Camellia was given to this genus by Linnæus, in honour of Kamel or Camellus, a Moravian Jesuit. The *Camellia Japonica*, as it grows in the woods and gardens of Japan and China, is a lofty tree of beautiful proportions, and clothed with a deep green shining foliage, with large, elegant flowers, either single or double, and of a red or pure white colour. There are numerous varieties of this species in China, the greater part of which have found their way to Europe and America, while other new varieties have been produced. The double-white, double-striped, and double-waratah, the last so called from the central petals resembling those of the waratah plant of Australia, are considered the finest varieties, and both grow and flower well. The peony-flowered and fringed are also much admired. The oil-bearing camellia (*Camellia oleifera*) is cultivated for its seeds, from which an oil is expressed that is very generally used by the Chinese in their cookery. It thrives best in a red sandy soil, and attains a height of 6 to 8 feet, producing a profusion of white blossoms and seeds. Besides these species, the *Camellia reticulata* and *Camellia Sasanqua* are cultivated in Europe.

The single red camellia is propagated by cuttings, layers, and seeds. It forms suitable stocks, on which the others are either inarched or budded and ingrafted. The cuttings to be selected are the ripened shoots of the preceding summer; these are taken off in August, being cut smoothly at a joint or bud; two or three of the lower leaves are taken off, and the cuttings then planted firmly in the soil with a dibble. Inarching or ingrafting is performed early in spring, when the plants begin to grow. A few seeds are sometimes obtained from the single red and semi-double camellias, and from the single waratah. These require two years to come up, but make the best stocks of any.

CAMELOPARD, or GIRAFFE (*Camelopardalis giraffa*, Linn, or *Giraffa camelopardalis*), a very remarkable genus of mammiferous quadrupeds belonging to the order of the ruminants, characterized by having eight incisor teeth in the lower jaw; a bony prominence on the frontal bone; horns covered by the skin of the head, and having a bristly fringe round their tips; callosities upon the sternum and knee joints; a tuft at the end of the tail; a reddish mane extending from the occiput along the whole of the neck and shoulders, as far as the root of the tail. There is only one existing species of giraffe. The body of the giraffe having some resemblance to that of the camel, and the colour of its skin being an impure or yellowish white, spotted with rhomboidal patches of fawn colour, something like that of the leopard, led to its receiving the names of these animals conjoined. In its manner of kneeling for the purpose of sleeping, in the length of its neck, and the presence of callosities on the lower part of the breast and over the joints, it has a further similarity to the camel. Its horns, which are persistent, and are present both in the male and the female, are of a peculiar nature, being short, bony growths, covered with skin and hair, not resembling those of any other animal. Its most striking peculiarity is the great apparent height of its foreparts, which rise very suddenly from the fore shoulders. Measured from the ground to the top of head, the animal is from 15 to 19 feet high. The posterior extremities are not higher than 9 feet; but the difference in length between the anterior and posterior extremities is by no means as great as would be inferred from the appearance of the animal. The great difference is owing to the length of the neck, which tapers upwards, and at its base is rendered exceedingly thick by the long dorsal and cervical spinous processes that give attachment to its powerful muscles and ligaments. The trunk of the body is short in proportion to the neck, and the fore limbs are more robust than the posterior. The hoofs are rounded and cleft, like those of the ox. The tail is slender, cylindrical and terminated by a tuft 3 or 4 inches long. The eyes are large, fine, and brilliant; the ears, both in length and figure, more resemble those of the ox. It is a mild, timid, and harmless animal, choosing dense forests for its residence, and feeding on the leaves and shoots of trees, which it conveys to its mouth by means of its long and almost prehensile tongue. When it browses the herbage on the ground, it is not, as has been supposed, under the necessity of kneeling, but it stretches out its fore-legs as wide as possible till it can reach the ground by means of its long neck. Its natural mode of feeding, for which it seems to be especially constructed, is by browsing upon trees or shrubs of considerable elevation. The giraffe is a native of a great part of Africa, from Abyssinia and Sennar to Senegal and the regions south of the Zambesi, but its range in South Africa is becoming more and more limited. It is hunted and killed by the natives for the sake of its large and beautiful skin, as well as for the marrow of its bones, considered by them to be an exquisite dainty. The flesh of the young camelopard is said by travellers to be an acceptable article of diet. At birth it measures 6 feet from the fore-hoofs to the top of the head, and a few days after birth it is able to follow its mother. The period of gestation is nearly fifteen months. The giraffe has long been known to naturalists, and opportunities of examining living specimens have long been common. They were brought living to Rome to adorn the public games and festivals, as Pliny states, during the dictatorship of Cæsar. Figures of the animal are still preserved in the Prænestine pavement wrought under the orders of Sulla. The figure of the giraffe also occurs among the hieroglyphic monumental drawings of the Egyptians. The giraffe moves with great celerity, and it requires a swift horse to equal its speed when only in a trot. It is easily tamed, but is not capable of being applied to any useful purpose. Many specimens have at different times been brought to Europe as presents to sovereigns or for exhibition. The Royal Zoological Society of London imported four giraffes in 1836, one of which brought forth the first young one known to have been bred in captivity. See plate at CETACEA.

CAMEL'S THORN, a genus of plants belonging to the natural order Leguminosæ, and the sub-order Papilionaceæ. They are herbaceous or half-shrubby plants, with simple leaves, minute stipules, axillary peduncles terminating in spines, and red flowers arranged in racemes. Only three species of this genus are known, the *Alhagi Camelorum*, *Alhagi Nipalensis* and *Alhagi Maurorum*. They grow in the deserts of Egypt and the East, and their common name is derived from the fact that they afford a food much relished by camels. The first two species (if not the third) yield a gummy, saccharine exudation like manna.

CAMEO, in the proper sense, a gem engraved in relief, opposed to *intaglio*, in which the figure is sunk in the surface. The ancients generally used the onyx for this purpose. They were carved according to the layers of the stone, so that the ground should be of a different colour from the figure in relief; and it is to gems cut in this way that the word is now generally applied. One of the most famous cameos is an onyx representing the Apotheosis of Augustus, 1 foot high and 10 inches wide. Cameos are often cut in shells having layers of different colours. See GEM SCULPTURE.

CAMERA LUCIDA (*light chamber*), an optical instrument employed to facilitate the sketching of objects from nature. It acts by total reflection, and may have various forms, of which that proposed by Wollaston, and represented in the accompanying figures, is one of the commonest. The essential part is a totally reflecting prism with four angles, one of which is 90°, the opposite one 135°, and the other two each 67° 30′. One of the two faces which contain the right angle is turned towards the object to be sketched. Rays falling in a straight line on this face, as *x r*, are totally reflected from the face *c d* to the next face *d a*, whence they are again totally reflected to the fourth face, from which they emerge in a straight line. An eye (*pp*) placed so as to receive the emergent rays, will see an image of the object in a direction at right angles to that in which the object lies. In practice, the eye is held over the corner *a* of the prism in such a position that one half of the pupil receives these reflected rays, while the other half receives light in a parallel direction

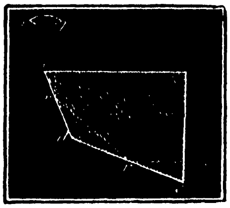


Fig. 1.

outside the prism. The observer thus sees the reflected image projected on a real back-ground, which consists of a sheet of paper for sketching. He is thus enabled to pass a pencil over the outlines of the image—pencil, image, and paper being simultaneously visible. It is very desirable that the image should lie in the plane of the paper, not only because the pencil point and the image will then be seen with the same focussing of the eye, but also because parallax is thus obviated, so that when the observer shifts his eye, the pencil point is not displaced on the image. As the paper, for convenience of drawing, must be at a distance of about a foot, a concave lens, with a focal length of something less than a foot is placed close in front of the prism in drawing distant objects. By raising or lowering the prism in its stand (fig. 2), the image of the object to be sketched may be made to coincide with the plane of the paper. The prism is mounted in such a way that it can be rotated either about a horizontal or a vertical axis; and its top is usually covered with a movable plate of blackened metal, having a semicircular notch at one edge, for the observer to look through.

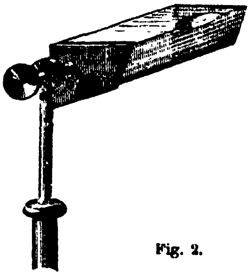
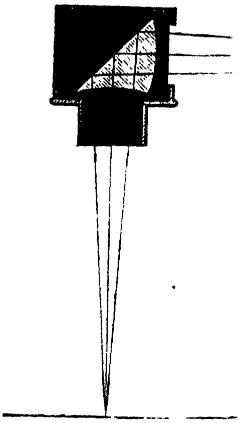


Fig. 2.

Another form of the camera lucida, that of Amici, an Italian optician, is sometimes preferred to that of Wollaston, inasmuch as it allows the observer to change the position of his eye considerably without ceasing to see the image of the object he is tracing. The prism in this case is triangular in shape, and one of the angles is a right angle. In using it, the right angle is turned upwards, so that one of the perpendicular faces is turned towards the object in an oblique direction, while the edge of the other perpendicular face meets a transparent glass plate at right angles. The rays from the object falling upon the face of the prism which is turned towards it are, after being more or less refracted, thrown upon the base of the prism, from which they are totally reflected in the direction of the other perpendicular face. In emerging from the prism at this face, they are again refracted and thrown upon the transparent glass plate. By this, again, the rays are partially reflected, being thrown upwards in the direction of the eye of the observer, who, looking through the plate, sees an image of the object on a sheet of paper beneath, the outlines of which can be traced by a pencil as before.

CAMERA OBSCURA (*dark chamber*), an optical instrument employed for exhibiting the images of external objects in their forms and colours, so that they may be traced, and a picture formed. From certain scattered observations in the writings of Friar Bacon, it would appear that he was acquainted with the principle upon which the camera obscura is constructed, but the first complete description of the instrument is found in a work published three centuries later at Antwerp by a Neapolitan physicist, Giovanni Baptista Porta, who was also the first to construct an instrument of the kind.

The simplest form of this instrument consists of a darkened chamber, into which no light is permitted to enter, excepting by a small hole in the window-shutter. A picture of the objects opposite the hole will then be seen on the wall, or a white screen placed so as to receive the light coming through the opening. The images thus obtained become sharper as the size of the hole is diminished; but this diminution involves loss of light, so that it is impossible by this method to obtain an image at once bright and sharp. This difficulty can be overcome by employing a lens. If the objects in the external landscape are all at distances many times greater than the focal length of the lens, their images will all be formed at sensibly the same distance from the lens, and may be received upon a screen placed at this distance. The images are inverted, and are of the same size as if a simple aperture were employed instead of a lens. This is the principle of the camera obscura properly so called. It is a kind of tent surrounded by opaque curtains, and having at its top a revolving lantern, containing a lens with its axis horizontal, and a mirror placed behind it at a slope of 45°, to reflect the transmitted light downwards on a sheet of white paper lying on the top of a table. Images of external objects are thus depicted on the paper, and their outlines can be traced with a pencil if desired. It is still better to combine lens and mirror in one by the arrangement represented in section in the figure. Rays from external objects are first refracted at a convex surface, then totally reflected at the back of the lens which is plane, and finally emerge through the bottom of the lens, which is concave, but with a larger radius of curvature than the first surface. The two refractions produce the effect of a converging meniscus. This instrument, which was formerly chiefly employed for purposes of amusement, has now become well-known from its application to photography. The camera obscura employed by photographers is a box, one half of which slides into the other, with a tube in front containing an object-glass at its extremity. The object-glass is usually compound, consisting of two single lenses, an arrangement which is very commonly adopted in optical instruments, and which has the advantage of giving the same effective focal length as a single lens of smaller radius of curvature, while it permits the employment of a larger aperture, and consequently gives more light. At the back of the box is a slide of ground glass, on which the image of the scene to be depicted is thrown, in setting the instrument. The focussing is performed in the first place by sliding the one half of the box into the other, and then by means of a pinion attached to the tube in front which moves the lens. When the image has thus been rendered as sharp as possible, the ground-glass slide is removed, and a sensitized plate substituted, which not only receives, but retains the image.



CAMERARIUS, Joachim, born in 1500, at Bamberg, one of the most distinguished scholars of Germany, who contributed to the progress of knowledge, in the sixteenth century, by his own works as well as by editions of Greek and Latin authors with commentaries, and by a better organization of the universities at Leipzig and Tübingen, and of the gymnasium at Nürnberg. He also took an important part in the political and religious affairs of his time. He was a friend of Melanchthon, and was held in great esteem by the emperors Charles V., Ferdinand I., and Maximilian II. In 1555 he was deputy of the University of Leipzig to the diet of

Augsburg, and died in 1574. His proper name was Liebhard, but he changed it to Camerarius, because his ancestors had been chamberlains (late Latin *camerarii*) at the court of the bishops of Bamberg.

CAMERINO (ancient *Camerinum*), a town of Italy, province of Macerata, 41 miles s.w. of Ancona, seat of an archbishopric. It contains some good public buildings, among which are the archiepiscopal palace and the cathedral. There is a university, founded in 1727. Silk is manufactured, and forms an article of commerce. Pop. (1881), 11,761.

CAMERON, John, an eminent Scottish divine and theologian, was born at Glasgow about 1580. After completing his education at his native place, he visited France in 1600 and was appointed professor of philosophy at Sedan, and afterwards minister at Bordeaux. He subsequently accepted the divinity chair at Saumur, where he continued till 1620. He then removed to Scotland and was made principal of the university of Glasgow. A few years later he returned to France, where he met his death through being maltreated on the streets by a party of Roman Catholic zealots. He was the author of De Triplici Dei cum Homine Fœdere and other works, on which was based the System of Universal Grace, by his disciple Amyraut.

CAMERON, Richard, Scottish Covenanter and victim of his own fanaticism, whose name is still retained in the popular designation of a Scottish sect, was born about 1648 at Falkland in Fife. He was at first a schoolmaster, and for a time was tutor in the family of Sir Walter Scott of Harden. Being converted by the field-preachers, he became an enthusiastic votary of the Covenant. On the 20th of June, 1680, in company with about twenty other persons, well armed, he entered the village of Sanquhar and proclaimed at the cross that he and those who adhered to him renounced their allegiance to the king on account of his having abused his government, and also declared a war against him and all who adhered to him, at the same time avowing their resolution to resist the succession of his brother the Duke of York. The privy-council immediately put a reward of 5000 merks upon Cameron's head, and 3000 upon those of Cargill and Douglas, his associates; and parties were sent out to waylay them. The little band kept together in arms for a month in the mountainous country between Nithsdale and Ayrshire. But at length, on the 22nd of July, when they were lying in Airdsmoss, near Auchinleck in Ayrshire, Bruce of Earlshall approached them with a party of horse and foot much superior in numbers. A brief skirmish took place, in which the insurgents were allowed even by their enemies to have behaved with great bravery; but nothing could avail against superior numbers. Cameron being among the slain, his head and hands were cut off and carried to Edinburgh, along with the prisoners. The name of Cameron was applied to the small but zealous sect of Presbyterians which he had led in life, and was also used in a wider and looser sense. The 26th Regiment, which was raised at the Revolution out of the west-country people who flocked to Edinburgh, was styled on that account the Cameronian Regiment. It is now known as the Cameronians or Scottish Rifles.

CAMERONIANS. See Reformed Presbyterians (also preceding article).

CAMEROONS, or Kamerun, a German colonial possession in West Africa extending inland from the Bight of Biafra to the north-east and north as far as Lake Tchad. It is separated from the British territory on the north-west by a line running north-east from the Rio del Rey to a point on the river Benue east of Yola, and from there north-east to the south shore of Lake Tchad. From French Congo on the south it is marked off by a line running east from the mouth of the Campo river to the river Sanga, and from there the eastern boundary proceeds first north-west to 4° N. lat. 15° E. long., then along that meridian to about 8° 30′ N., when it proceeds N.W. to the parallel of 10°, which forms the boundary eastwards to the Shari river. This river itself to its mouth in Lake Tchad serves as the north-eastern boundary. The territory receives its name from the Cameroon River, which enters the Bight by an estuary nearly 20 miles wide. The swamps along the banks of the river render this district unhealthy for Europeans. North-west of the river lies the volcanic group called the Cameroon Mountains, which rise to a height of 13,760 feet. The lower slopes of these mountains are more healthy, and are covered with ebony, red-wood, and palm-trees. More important than the Cameroon River is the much longer Sanaga or Mbam, entering the Bight a little south of the former, and navigable for 40 miles inland to Idia. Among cultivated plants are the banana, oil-palm, coco-nut, ground-nut, manioc, yam, sweet-potato, and colocasia; of more recent introduction are cacao, coffee, tobacco, &c. Among the minerals are gold and iron. There is a considerable trade in cotton, ivory, and oil. The inhabitants are almost entirely of the Bantu stock, widely diffused throughout the more southerly portion of the continent, and many of them have almost regular European features. The coast of the Cameroon territory was annexed by Germany in 1884, and the interior has since been acquired, the whole being now a German colony under a governor. The seat of government is at Cameroons, a group of native villages on the estuary of the Cameroon River, but the greater part of the territory is only nominally under German rule. Area, 191,130 sq. miles; pop. 3,500,000.

CAMILLUS, Marcus Furius, a Roman patrician, famous as the deliverer of the city of Rome from the Gauls. In B.C 396 the Faliscans, Fidenates, and Veientines revolted, and Camillus was appointed dictator to carry on the war against them. After defeating the Faliscans and Fidenates, he advanced to Veii, into which he penetrated by a subterranean passage, thus capturing a place which for ten years defied the Roman power. He made a triumphal entry into Rome in a splendid chariot drawn by four white horses. In B.C. 394 Camillus conducted the siege of Falerii, the inhabitants of which defended themselves to the last extremity. A schoolmaster delivered into his power the children of the most distinguished of the inhabitants, but he sent back the traitor, with his hands bound, while the boys beat him with rods as they returned to their parents. This generosity induced the besieged to surrender; and the senate allowed Camillus to determine their fate. He contented himself with obliging them to pay the arrears due to his soldiers; but this increased the number of his enemies. In B.C. 391 he was invested with the dignity of an interrex, and had to contend with all the consequences of hatred. The tribune of the people, Apuleius, accused him of having embezzled a part of the plunder of Veii. Camillus, who foresaw his condemnation, went into voluntary exile, although his friends offered to pay the sum demanded of him. Less magnanimous than Aristides in a similar situation, Camillus is said to have prayed the gods to compel his ungrateful country to a speedy repentance. The wish was granted. The Gauls under their leader Brennus had obtained possession of Rome, with the sole exception of the capitol. (See Brennus.) Camillus, who was residing in Ardea, aroused the inhabitants of that city to resistance, and defeated the Gauls, who were carelessly encamped before it. The Romans who had fled to Veii, besought him to place himself at their head; but he declared that he was ready to do this only in case the Roman people, now in the capitol, would commit to him the chief command. Pontius Cominius, a young plebeian, had the courage and the good fortune to carry the message from the city. Camillus was unanimously appointed dictator, and soon saw himself at the head of an army of 40,000 men. The Gauls were defeated, and left their camp by night. He now made a triumphal entry into Rome, amidst the acclamations of the people and the army, who greeted him with the name of *Romulus, father of his country*, and *second founder of the city*. But the city was a heap of ruins, and the tribunes proposed that the whole Roman people should emigrate to Veii, while, at the same time, they sought to excite in the people apprehensions of the power of Camillus. The senate, however, frustrated their designs, and Camillus retained the dictatorship. Rome was rebuilt. The Æquians, Volscians, the Etruscans, and even the Latins, now united against Rome. Camillus, for the third time dictator, armed the whole people, came to the assistance of the military tribunes, who were surrounded by the Volscians, fired the enemy's camp, and gave the plunder to his soldiers. He then took Bolæ, the chief city of the Æquians, and compelled the Etruscans to retreat. He now triumphed for the third time, restored from the booty to the Roman ladies what they had formerly contributed to the accomplishment of his vow, and retired into a private station. Soon after, in B.C. 386, when the inhabitants of Antium attacked Rome, he was appointed consular tribune for the fourth time, obtained from his colleagues the chief command, and took severe vengeance on the enemy. His fifth consular tribunate happened two years later. During his sixth consular tribunate, B.C. 381, he attacked and defeated the revolted Volscians, and the Praenestines, who on this occasion were the allies of the former. The inhabitants of Tusculum, against whom he then advanced, surrendered without resistance, and obtained the friendship of Rome, which they had lost by their own fault. Camillus was appointed dictator for the fourth time, B.C. 368, in order to oppose the measures of Licinius and Sextius, the tribunes of the people, who desired to have the office of consul thrown open to the plebeians as well as the patricians; but he soon resigned the power, probably because he saw that further resistance was useless. He was already eighty years old when the appearance of a new army of Gauls terrified Rome. He once more resumed the dictatorship B.C. 367, attacked the Gauls, dispersed them entirely, and obtained again the honour of a triumph. As new disturbances had broken out, Camillus did not lay down his office till the ferment was quelled. After this he caused a temple to Concord to be built near the capitol, retired from public life, and died soon after, B.C. 365, of the plague, greatly lamented by the Romans.

CAMISARDS, Calvinists in France (in the Cevennes), who, in the beginning of the eighteenth century, in consequence of the persecution to which they were exposed after the revocation of the Edict of Nantes in 1685, rose against the royal deputies. The name is usually thought to be derived from 'camise,' a provincial form of the French word 'chemise,' signifying a shirt, and it is said to have been applied to them either because their ordinary outer garment was a kind of shirt or blouse, or because on certain occasions they wore their shirts above their other garments. The first occasion on which they broke out into open revolt against the royal deputies was on the night of the 24th of July, 1702, when fifty of them attacked the house of the Abbé du Chayla, one who had signalized himself by his cruelty during the persecutions. They set free the prisoners whom they found confined in the dungeons, and put the abbé himself to death. This was the signal for a general rising of the mountaineers. The government sent troops to punish the authors of these acts. A certain Jean Cavalier, a peasant, whom a fortune-teller had pointed out as the deliverer of Israel, placed himself at the head of the Camisards. His unlimited authority with his adherents, his talents, and courage, enabled him to oppose the measures of experienced generals with so much success that negotiation was substituted for force. The Marshal Villars in 1704 made a treaty with Cavalier, by virtue of which Cavalier himself was received into the royal service as a colonel. This treaty, however, did not satisfy his associates, because it did not concede to them liberty of conscience, and on that account Cavalier was reproached as a traitor who had sacrificed the cause of his co-religionists to his own interest. At the court, too, he was received with coldness, so that in a short time he was glad to go into voluntary exile. He went to England, where Queen Anne gave him a favourable reception. Voltaire, who became acquainted with him in London, speaks of him in high terms. At the time of his death Cavalier was general and governor of Jersey. The name camisards blancs (white camisards), or cadets de la croix (cadets of the cross), was given to a band of Roman Catholics formed to put down the Calvinistic camisards, who were called camisards noirs, or black camisards.

CAMLET, or CAMBLET (in French *camelot*), a name applied in England to a fabric made of long wool, hand spun, sometimes mixed with cotton or linen yarn. Various derivations of the word are given. Some consider it to be of the same root with camel, because it was originally made of camel's-hair; others derive it from the Arabic 'chamal,' signifying fine, because according to them it was originally made of the fine hair of the Angora goat.

CAMOENS, LUIS DE, the most celebrated poet of the Portuguese, one of the great men whose merit was first recognized by posterity, while their own age suffered them to starve. He was born at Lisbon probably in 1524, or 1525; for it appears from a catalogue of persons embarking for the East Indies in 1550 that Camoens, whose age is there given at twenty-five years, offered himself as a volunteer for the campaign. According to others he was born in 1517. His father, Simon Vaz de Camoens, was a ship captain, and perished by shipwreck on the coast of Goa about 1552. Camoens studied at Coimbra. At that time writers were esteemed in proportion as they imitated the ancients. Camoens was inspired by the history of his country, and by the manners of his age. His lyric poems, like the works of Dante, Petrarch, Ariosto, and Tasso, belong to the literature formed under the influence of Christianity. After the completion of his studies he returned to Lisbon, where he fell deeply in love with a lady of the palace, Catharina d'Atayada. Violent passions are often joined with great talents—Camoens had both. He was exiled to Santarem on account of disputes in which his love for Catharina involved him. From despair he became a soldier, and served in the fleet which the Portuguese sent against Marocco. He composed poetry in the midst of battles, and as danger kindled his genius, so genius animated his courage. An arrow deprived him of his right eye before Ceuta. He hoped that his wounds would receive a recompense, though his talents were not appreciated; but envy opposed his claims. Full of indignation at seeing himself neglected, he embarked in 1553 for India. He landed at Goa. His powerful imagination was excited by the heroic deeds of his countrymen in this quarter, and although he had much reason to complain of them, he could not resist the desire of celebrating their glory in an epic. But this vivacity of mind, essential to the poet, is not easily united with the moderation which a dependent condition demands. Camoens was displeased with the abuses of the government in India, and wrote a satire, which caused his banishment to Macao. Soon after he was removed to the Moluccas, but after three years of captivity a new viceroy recalled the decree of banishment against him, and appointed him administrator of the effects of deceased persons at Macao. His chief poem, the Lusiad, was composed partly during the period of his captivity, and partly while he held the office of administrator. Camoens was at last recalled from his banishment. At the mouth of the river Mekon, in Cochin China, he was shipwrecked, and saved himself by swimming—holding in one hand above the water the manuscript of his poem, the only treasure which he rescued from the waves, and which was dearer to him than life. In Goa he encountered new persecutions; he was confined in prison for alleged embezzlement of funds intrusted to him during his tenure of office at Macao, and was not allowed, until his friends became responsible for him, to embark and return to Lisbon in 1569. King Sebastian, yet hardly past the age of childhood, took an interest in Camoens. He accepted the dedication of his epic (which appeared in two editions, varying both in the text and the orthography, in 1572), and being on the point of embarking on his expedition against the Moors in Africa, he felt more sensibly than others the genius of the poet who, like him, loved dangers if they led to glory. But Sebastian was killed in a battle before Alcaçar in 1578. With him the royal family became extinct, and Portugal lost her independence. Every source of assistance, as well as every hope of Camoens, was destroyed by this event. So great was his poverty that at night a slave, whom he had brought with him from India, begged in the streets in order to support the life of his master. In this misery he yet wrote lyric poems, some of which contain the most moving complaints. This hero of Portuguese literature, the ornament of his country and of Europe, died at last in 1579 at Lisbon. In 1596 a splendid monument was erected to his memory. Vasco da Gama's expedition to India is the subject of his great poem. The parts of it which are best known are the episode of Ines de Castro, and the appearance of Adamastor who, by means of his power over the storms, aims to stop Gama's voyage when he is about to double the Cape. In conformity to the taste of the time, Camoens united in this poem a narrative of the Portuguese history with the splendour of poetic description, and Christianity with mythological fables. He pleased himself with tracing the descent of the Portuguese from the Romans, of whom Mars and Venus are considered the progenitors and protectors. Since fable ascribes to Bacchus the first conquest of India, it was natural to represent him as jealous of the undertaking of the Portuguese. If the imitation of the works of classical antiquity has been of any disadvantage to the Lusiad, the injury consists, perhaps, in a diminution of the originality which one expects in a work in which India and Africa are described by an eye-witness. The versification of the Lusiad has something so charming and splendid that not only cultivated minds, but even the common people, are enraptured by its magic, and learn by heart and sing its beautiful stanzas. The general interest of the poem consists principally in the patriotic feeling which pervades it. The national glory of the Portuguese appears here in every form which invention can lend to it, and therefore the countrymen of Camoens must naturally admire this poem more than foreigners. Some critics pronounce the Lusiad a more powerful and pure historical painting than Tasso's Jerusalem Delivered. A valuable edition of the Lusiad (Os Lusiadas, &c.) was published by Joze Maria de Souza-Botelho (Paris, 1817). It has been translated into English by Sir R. Fanshaw, by William Julius Mickle, and more recently by R. F. Duff, by J. J. Aubertin (with Portuguese text), and by Sir R. F. Burton (with Life of Camoens, Commentary, &c.; 6 vols.). The works of Camoens, besides the Lusiad, consist of sonnets, songs, odes, elegies, eclogues, *redondillas*, epigrams, satires, letters, and three dramas (Amphitryon, after Plautus, King Seleucus, and the Love of Philodemus). (See the article PORTUGUESE LANGUAGE AND LITERATURE.) John Adamson's Memoirs of the Life and Writings of L. de Camoens (London, 1820, two vols.), of which the second volume contains a criticism on his works, are valuable. See also Madame de Stael's article respecting him in the Biographie Universelle (sixth vol.)

CAMOMILE, or CHAMOMILE (*Anthemis nobilis*), a well-known plant belonging to the natural order Compositæ, and the sub-order Corymbiferæ. It is perennial, and has slender, trailing, hairy, and branched stems. The leaves are doubly pinnate, with linear pointed pinnæ. The flower is white, with a yellow centre. Both leaves and flowers of this plant have a strong though not unpleasant smell, and a very bitter nauseous taste; but the flowers are more bitter and aromatic than the leaves. The principal use for which camomile flowers are applied is to excite vomiting and promote the operation of emetics. They have likewise been substituted for Peruvian bark in the case of intermittent fevers or agues, particularly on the continent of Europe, but not with much success. Both the leaves and flowers are employed in fomentations and poultices. They are also administered in substance as a powder or electuary, in infusion as tea, in decoction or extract, or in the form of an essential oil obtained by distillation. Camomile flowers are sometimes used by brewers as a substitute for hops. Distilled with water, an essential oil in small quantities is obtained of a greenish colour and strong pungent taste. So fragrant is the camomile plant that the places where it grows wild, on open gravelly commons, may easily be discovered by the somewhat strawberry-like perfume which is emitted by treading on them. This quality has sometimes induced the cultivation of camomile for a green walk in gardens. The plant is very abundant in Cornwall and some other parts of England, and at Mitcham and in Derbyshire it is cultivated for the London market.—Wild camomile (*Matricaria chamomilla*) is now out of use in England; but its medicinal properties resemble those of common camomile, and it is still used in some parts of Europe.

CAMONICA, or VALLE CAMONICA, a valley in North Italy, formed by two branches of the Rhætian Alps, watered by the Oglio, and stretching about 50 miles from N.N.E. to S.S.W. as far as Lake Iseo. It is a principal thoroughfare between Italy and the Tyrol.

CAMORRA, a well-organized association in Naples, the members of which (Camorristi) carried on extortion as a regular business, and were to be found at markets, fairs, and all public gatherings in the exercise of their employment. They might even be hired to commit murder. The association extended its ramifications over the whole of Naples. It had central stations in all the large provincial towns, and twelve in the city of Naples, and it had a regular staff of recruiting officers. Under the former regime it did not aim at concealment; but under the present more powerful government efforts are being made to suppress it. These efforts have not yet been crowned with complete success; but it is not denied that the power of the association has been greatly diminished. The members no longer dare to carry on their business openly. The army, which was formerly infested with them, and is said still to contain a considerable number, is gradually being freed from them, and in every way they are being brought under the power of the law.

CAMP means generally the place and aggregate body of tents or huts for soldiers in the field. In modern times a difference is often made between *camp* and *bivouac*, the former signifying the quarters of an army sheltered in tents; the latter the situation of one which dispenses with them, and remains either entirely in the open air, or, when time allows it, in huts built of branches, &c. (See Bivouac.) On the continent of Europe tents are now not much used; and the term camp accordingly is often employed where bivouac might be used.

Camps, of course, are of very ancient origin, since almost all nations in their infancy lived as nomads, dwelling in tents, as is the case with many tribes in Asia and Africa at the present day, for example the Arabs. Among the Greeks, the Lacedæmonians seem to have been the first who devoted attention to the art of forming military camps. The form which they adopted was the circular, that being the form which was best calculated to enable the general, who had his tent in the centre, to have a view of the whole camp, and to despatch assistance in the shortest possible time to any part of the camp that might be attacked. The Romans probably first carried the art of encampment to a high degree of perfection, on account of their many wars in distant and thinly settled regions, where their large armies found no cities to quarter in. Cæsar and several other Roman authors give us much information on their way of constructing a camp, and in Polybius we have a detailed description of the consular camp as it was made in his time. As this form of camp, with some modifications to suit different circumstances, continued to be the usual one during the whole period of the Roman domination, and down to the time of the invention of gunpowder, it will be of advantage to give a description of it. It was of the utmost importance that a suitable position for the camp should be selected, and accordingly the task of fixing the site of the camp was sometimes assumed by the general himself; but as a rule this was the duty of one of the military tribunes. When this was settled, a spot was chosen from which a view of the whole camp could be obtained, and this spot was marked by a white pole as the point from which the rest of the camp was measured out, and the place where the general's tent (*prætorium*) was to be erected. The form of the camp was a square, and it was divided into two parts by a street 100 feet in breadth called the *principia* or *via principalis*, which ran across the camp. One of these divisions occupied about one-third of the whole space, the other the remaining two-thirds; and it was in the former of these that the prætorium was situated, with an open area around it extending 100 feet on all sides. On the right of the prætorium was the *forum* or market-place, and on the left the *quæstorium*, where were the camp-stores under the superintendence of the quæstor. Beyond these again on each side there were select bodies of horse and foot taken from the *extraordinaries*, and behind this whole line of the encampment, and separated from it by a street 100 feet broad, was the place reserved for the main body of the extraordinaries, and for foreigners and occasional auxiliary troops. Immediately in front of the line of the encampment first described the tents of the military tribunes and of the *præfecti*, or officers of the allies, were erected, the former before the forum and quæstorium, the latter before the select bodies of horse and foot. These tents lined the principia on the side of the prætorium. On the other side of the principia the main body of the army was quartered, the allies being stationed on the right and left, the two Roman legions which belonged to every consular army in the middle. The whole was surrounded with a ditch (*fossa*) and a rampart (*vallum*) at the distance of 200 feet from the tents. On every side of the camp there was a gate. That behind the prætorium was called *porta prætoria*, the one on the opposite side *porta decumana*. The other two were at the ends of the principia, and were called respectively *porta principalis dextra* and *sinistra*. The camp was improved in strength and convenience according to the time that it was occupied, and in some cases, from the want of fortresses, it was made the basis of their military operations.

Since the invention of gunpowder intrenched camps, such as that just described, are of very little service, as they afford no protection against projectiles shot from long ranges. What are usually known as intrenched camps at the present day are much more elaborate affairs and cover a much greater area. They may consist of intrenched areas permanently connected with and under the protection of fortified places; thus they are sometimes attached to certain large cities on the chief roads, partly in order to defend them against the first attack of the enemy, and to prevent his possessing himself easily of the important resources which they afford, partly to give to retreating armies rallying-points able to furnish support to numerous soldiers. Camps which, though intrenched, are to be occupied merely for the period of a campaign, or which serve as a refuge for a few days only to a subordinate army, are termed 'lines' or 'temporary positions.' An example of the former was exhibited by the extensive lines of Torres Vedras. From the perfection of modern artillery strong detached forts form the chief defensive feature of intrenched camps of the present day. For temporary encampments in the field a position is selected such as is not only well supplied with wood, forage, water, and the other necessaries of a camp, but also one that may be easily defended; rifle-trenches, gun-pits, &c., may be constructed, sentinels of course being posted to provide against surprises.

It has recently become common to form camps in time of peace for the sake of disciplining the soldiers to a camp life, and exercising them in the evolutions connected with camps. These are called camps of *instruction*, of which we have examples in the camp formed for the British troops at Aldershot, and in the temporary camps pitched throughout the country for the training of the militia and volunteers.

CAMPAGNA, a town, Naples, province of Principato Citra, 18 miles E.N.E. of Salerno, surrounded by high mountains. It is the seat of a bishopric, and contains a superb cathedral, three parish churches, several convents, a college, an hospital, and a *mont-de-piété;* and has some trade and a large fair, held August 1. Pop. 9028.

CAMPAGNA DI ROMA, a territory in Italy which comprehends the greater part of old Latium, from 30 to 40 miles wide and 100 long. We usually understand by it the desert plain which commences near Ronciglione or Viterbo, and including the Pontine Marshes, extends to Terracina. In the middle of this region lies Rome, on its seven hills, and on the Tiber. The lakes of the Campagna are evidently craters of extinct volcanoes. Thus the Lake

Regillus above Frascati, lies at the bottom of an inverted cone of hard, black lava, rising in wild and naked masses from 40 to 60 feet high. The craters containing the Lakes of Albano and Nemi, have a very regular conical form. The Lake of Albano is also remarkable for its aqueduct, or *emissarium*, one of the most ancient and excellent works of the Romans, which discharges the waters of the lake through the mountains. It answers its original purpose even at the present day. There are, also, many sulphur springs here, particularly between Rome and Tivoli, where the water issues almost boiling from the earth, and forms the Lake of Solfatara, which contains floating islands, consisting of a calcareous deposit, that collects round substances thrown into the water. The vapours which rise from the ground all over the Campagna, and especially in the neighbourhood of this lake, are the cause of the malaria which renders the whole district so unhealthy. The soil of the Campagna is in general dry, but very fertile in the lower parts, though its cultivation is much neglected. From Monterosi to the hills of Albano a tree is seldom to be seen. Dispersed over the Campagna single huts are sometimes seen leaning against the ruins of old towers or temples, and patched up from their fragments. In the middle of the summer, when malarial fevers render a residence in the Campagna very dangerous, all the inhabitants who can do so take refuge in the neighbouring towns or in Rome itself; or they may retire with their cattle to the mountains. Many of the great numbers of sick persons who fill the Roman hospitals during the months of July, August, and September are chiefly inhabitants of the country. Besides their huts, innumerable ruins of temples, circuses, and monuments are scattered over the Campagna, particularly near the Via Appia; and long rows of aqueducts, some in ruins, some in a state of preservation, are overgrown with ivy and other plants. In the winter flocks of sheep pasture in these solitudes; during the summer they are driven up the Apennines. Herds of half-wild cattle remain during the whole year in the Campagna. Their keepers, however, soon become a prey to the pestilence, or fall into a gradual decline. They are mostly natives of the mountains, and serve the proprietors of the herds for trifling wages. Bonstetten saw at Torre Paterno, very near Rome, a herd of several hundred cows, the proprietors of which did not consider it worth while to milk them, though milk is as dear in Rome as in other large cities. The herdsmen are mounted, and armed with long lances, with which they manage the cattle very skilfully. Scarcely a ninth part of the Campagna is cultivated; the rest is used for pasturage. In the times of the ancient Romans, this dreary solitude exhibited a smiling picture of abundance and fertility. Yet even in those times the climate was far from being a healthy one. Strabo, Livy, Cicero, Horace, and others agree in describing the districts in the neighbourhood of Rome, Ardea, and other towns which stood in what is now the Campagna di Roma, as extremely unwholesome, especially at certain seasons of the year; and it was only through the greatest exertions on the part of the ancient cultivators, and the numerous aids to cultivation that stood at their command, that this tract, now so desolate, was then made so productive. There is no doubt, however, that the malaria is much more injurious now than it was in the time of the Romans. The most probable supposition is that its increased malignity was caused by the devastations of the barbarians, when the waters became stagnant from the want of human industry. Several of the popes, particularly Pius VI., have attempted to lessen the insalubrity of the air by the draining of the Pontine Marshes which form the southern portion of the tract. Recently the Italian government has taken up the problem, and by the year 1897 is reported to have laid out on reclamation works about £350,000, besides what has been spent by private persons. Much good is said to have already been done by the planting of the *Eucalyptus globulus*, or blue gum-tree, in certain localities.

CAMPAIGN generally denotes the season during which armies keep the field. Formerly, when war was not carried on with so much impetuosity as at present, campaigns lasted only during the warmer months; and towards winter the troops went into winter quarters, when the officers of the opposing armies often met very amicably at balls and other entertainments; but of late armies have kept the field through the winter till a decisive victory has been gained. Thus the Germans in the recent war with France prosecuted the siege of Paris all through the winter, while at the same time other armies were operating in different parts of France.

CAMPAN, Jeanne Louise Henriette (originally *Genet*), born at Paris, October 6, 1752, became reader to the daughters of Louis XV.; gained the favour of the wife of the dauphin, afterwards the Queen Marie Antoinette, who gave her in marriage to the son of her private secretary, M. Campan, and appointed her the first lady of the bed-chamber. Madame Campan gave her patroness many proofs of fidelity and attachment, and wished to follow her into the temple after the 10th of August, 1792, which, however, Péthion did not allow. After the fall of Robespierre, Madame Campan established a boarding-school for the education of young ladies at St. Germain, which soon acquired a wide reputation. On this account Napoleon appointed her the principal of an institution founded by him for the daughters of the officers of the Legion of Honour, at Ecouen, which she organized and superintended for seven years. After the restoration Louis XVIII. abolished this institution, and Madame Campan lost her situation. Her only son died in 1821, in consequence of ill-treatment inflicted because he was a relation of Marshal Ney. Madame Campan died at Mantes in 1822. Of her Memoirs respecting the Private Life of the Queen Marie Antoinette, with Recollections of the Times of Louis XIV. XV. and XVI., in four vols. (translated into English 1823), the fifth edition appeared at Paris 1824. They contain interesting contributions to the history of the French revolution. Her Journal Anecdotique (Paris, 1824), and her Correspondance inédite avec la Reine Hortense (Paris, 1835), are rich in piquant anecdotes of Napoleon, Alexander I., and others.

CAMPANA, La, a town in Spain, Andalusia, province of, and 32 miles N.E. by E. Seville, left bank Madre-Vieja, an affluent of the Guadalquivir. It has two squares, a parish church, two endowed schools, a town-hall, insecure and unhealthy prison, public storehouse, cemetery, and several fountains. The inhabitants are engaged in weaving, brick-making, expressing oil, cultivating grain, and rearing cattle. Pop. (1887), 4227.

CAMPANARIO, a town in Spain, Estremadura, province of, and 62 miles E. by S. Badajos, 8 miles N.N.W. Castuera, with narrow, ill-built, and neglected streets; a parish church, chapel of ease, two endowed schools, a town-house, prison, &c. Manufactures — linen fabrics, esparto ropes, wine, and oil. Trade—grain, wool, and esparto. Pop. 7007.

CAMPANELLA, Tommaso, born 5th September, 1568, at Stilo, in Calabria, in Italy, famous for his talents and misfortunes. He displayed great quickness of parts when quite young, and at the age of fifteen entered into the order of the Dominicans. He studied theology and other branches of knowledge with assiduity, but was principally attracted by philosophy. The opinions of Aristotle, then generally taught in the schools, appeared to him unsatisfactory; and in 1591 he published at Naples a work entitled Philosophia Sensibus demonstrata, intended to show the futility of the prevailing doctrines. This book procured him some admirers, and more enemies. He then went to Rome, and afterwards to Florence, where he was well received by the Grand-duke Ferdinand. In 1598 he returned to Naples, and revisited shortly after Calabria, where, in the following year, he was arrested on a charge of conspiracy against the Spanish government, to which Naples was then subject. A scheme was imputed to him of having engaged the Turks to assist him in making himself master of Calabria. On this improbable and apparently unfounded accusation he was imprisoned, and after being repeatedly tortured, condemned to perpetual confinement. In this situation he wrote many learned works, afterwards published. At length, in 1626, Pope Urban VIII. procured his removal to Rome, and in 1629 gave him his liberty, and bestowed on him a pension. Dreading some further persecution from the Spaniards, he withdrew in 1634 to France, where he was honourably received by Louis XIII. and Richelieu, and much esteemed by the learned men of that country. He died at the monastery of his order in Paris in 1639. Among his numerous works may be mentioned his Atheismus Triumphatus (1631); Monarchia Messiæ (Aix, 1633); a Defence of Roman Catholicism and the Papal Supremacy; Discorsi della Libertà (Aix, 1633); Prodromus Philosophiæ Instaurandæ (Frankf. 1617); De Sensu Rerum et Magia (Frankf. 1620); De Monarchia Hispanica Discursus (Amsterdam, 1640). A Life of Campanella, by Baldacchini, was published at Naples in two vols. (1840–43).

CAMPANIA, the ancient name of a province of Italy, in the late Kingdom of Naples, which, partly on account of its natural curiosities, including Vesuvius, the Phlegræan fields, the Lake of Avernus, and partly for its remarkable fertility, was a favourite resort of the distinguished Romans, who built there magnificent country houses. Cumæ, Puteoli, Naples, Herculaneum, Pompeii, Baiæ, Stabiæ, Salernum, and Capua, the principal cities of Campania, are names rich in classical associations. The Appian and Latin Ways led into the interior of this charming province. Even now Campania, or the province of Caserta, is the most beautiful and fruitful part of Italy, and no traveller can wish for a more delightful country than the fields of Campania, filled in the month of April with barley 4 feet high, and adorned with lofty poplars, which are connected by luxuriant vines, forming a canopy over the fields. 'There,' says Goethe, 'it is worth while to till the ground.'

CAMPANILE, a detached tower in some parts of Italy, erected for the purpose of containing bells. Several of them have deviated considerably from the perpendicular, in consequence of their great height and narrowness of base. The campanile of Pisa, called *Torre Pendente*, or Hanging Tower, is one of the most remarkable. The architects of it were Bonano of Pisa, and Willhelm of Innsbruck, and it was begun in 1174. The tower consists of eight stories, each of which is surrounded by columns, and it inclines nearly 13 feet from the perpendicular. Another celebrated campanile is that which was begun at Florence in 1334, after the designs of Giotto, and finished by Taddeo Gaddi. Its height approaches 300 feet, and it is adorned with fifty-four bass-reliefs, and sixteen statues, representing biblical, pagan, and allegorical subjects. Giotto intended to surmount this tower with a spire of nearly 100 feet in height, but his intention was never carried out. The Torre degli Asinelli and the Torre Garisenda at Bologna are also remarkable specimens of the Campanile. See Bologna.

CAMPANULA, a genus of plants belonging to the natural order Campanulaceæ, distinguished by the bell-shape of the corolla; hence the name derived from the Italian *campana*, a bell. Almost all the species have long white roots of an excellent quality; that of rampion (*Campanula rapunculus*) is used as food in France and Italy. Many of the species are showy garden flowers. The common Scottish bluebell (*Campanula rotundifolia*) is a well-known wild flower. The pyramidal bell-flower (*Campanula pyramidalis*), named from its pyramidal stem, on which, for at least two months, appears a succession of bluebells, is a splendid species, a native of Istria and Savoy, and first cultivated in Britain by Gerarde. For a long time it was a fashionable flower in the halls of the nobility, and was usually trained in a spreading fan-shape, so as to cover the fireplace in summer; and for this purpose it is still esteemed in Holland. The Canterbury-bell (*Campanula medium*) is a well-known garden-flower, with double and single varieties; blue, red, purple, and white coloured. The clustered campanula (*Campanula glomerata*) is a rock or pot plant, and requires a dry poor soil in order to bring out the vivid tints of the corolla. It is of very easy culture.

CAMPANULACEÆ, a natural order of herbaceous and shrubby plants, generally abounding in a a bitter, white juice. Their leaves are alternate and entire, rarely opposite. Their flowers form spikes, thyrsi, or heads. They have a monosepalous calyx, with four, five, or eight persistent divisions, and a regular or irregular monopetalous bell-shaped corolla, having its limb divided into as many lobes as there are divisions in the calyx. The stamens are five in number, the anthers free, or brought together in the form of a tube. The ovary is inferior or semi-inferior, with two or more cells, each containing numerous seeds. The style is simple, terminated by a lobed stigma, sometimes surrounded by hairs. The fruit is a capsule crowned by the limb of the calyx, with two or more cells opening either by means of holes which are formed near the upper part, or by incomplete valves. The seeds are very small and very numerous. Lindley enumerates 28 genera and 500 species belonging to this order. They are chiefly natives of the temperate and colder climates of the northern hemisphere.

CAMPBELL, Archibald, Earl and Marquis of Argyle, was born in 1598. He was a zealous partisan of the Covenanters. Charles I. created him a marquis in 1641, notwithstanding the opposition he had shown to his favourite object of effecting a conformity between the churches of Scotland and England. It was by his persuasion that Charles II. visited Scotland, and was crowned at Scone in 1651 At the Restoration he was confined in the Tower for five months, and was then sent to Scotland, where he was tried for high treason in connection with the death of Charles I., and beheaded in 1661.

CAMPBELL, Archibald, Earl of Argyle, was the son of the above, and served the king with great bravery at the battle of Dunbar, and was excluded from the general pardon by Cromwell in 1654, for his exertions in favour of the royal cause. He was afterwards made a privy-councillor and one of the lords of the treasury. When the Duke of York was in Holland, advantage was taken of the Earl of Argyle's refusal to take contradictory oaths, to try him again for treason, and he was once more condemned to suffer death by a most iniquitous act. He, however, escaped to Holland, from whence he returned with several other disaffected persons, and landed in the Highlands, with a view of aiding the Duke of Monmouth. The plan, however, failed; and he was taken by some country people, who conveyed him to Edinburgh, where he was beheaded in 1685.

CAMPBELL, George, a distinguished Scottish divine, was born at Aberdeen in 1709. He was educated at Marischal College, and afterwards articled to a writer of the signet at Edinburgh. In 1741 he relinquished the law and studied divinity. In 1759 he was appointed principal of Marischal College. In 1763 he published his celebrated Dissertation on Miracles, in answer to the Essay on Miracles of Mr. Hume. This Dissertation was translated into the French and Dutch languages. In 1771 Campbell was chosen professor of divinity, and in 1776 gave to the world his Philosophy of Rhetoric, which established his reputation as an accurate grammarian, a sound critic, and a tasteful scholar. He also published occasional sermons. The last work which he lived to publish was his Translation of the Gospels, with Preliminary Dissertations and Notes (two vols. 4to). He died in 1796.

CAMPBELL, John, the second Duke of Argyle, and Duke of Greenwich, was the son of Archibald, first duke of Argyle, and was born in 1678. In 1706 he served under the Duke of Marlborough, and was brigadier-general at the battle of Ramilies. He also distinguished himself as a statesman, and was a promoter of the union, for which he incurred considerable odium in his own country. He commanded at the battles of Oudenarde and Malplaquet with great honour, and assisted at the sieges of Lisle and Ghent. For these services he was made a Knight of the Garter in 1710, and the year following was sent ambassador to Charles III. of Spain. He was also appointed commander-in-chief of the English forces there. In 1712 he had the military command in Scotland, of which post he was soon after deprived for opposing the court measures; but on the accession of George I. he was restored, and received additional honours. In 1715 he engaged the Earl of Mar's army at Dunblane, and forced the Pretender to quit the kingdom. In 1718 he was created an English peer with the title of Duke of Greenwich. He filled successively several high offices, of which he was deprived for his opposition to Sir Robert Walpole, but on the removal of that minister he was replaced. He died in 1743, and was buried in Westminster Abbey, where is a noble monument to his memory.

CAMPBELL, John, a miscellaneous writer, was born at Edinburgh, Mar. 8, 1708, and removed, when young, to England. His earliest productions are not certainly known; but in 1736 he published the Military History of Prince Eugene and the Duke of Marlborough (two vols. folio), which gained him so much reputation, that he was engaged, soon after, to assist in writing the ancient part of the Universal History, in sixty vols. 8vo. In 1742 he published the first two volumes of the Lives of the Admirals and other British Seamen, the two last volumes of which appeared in 1744. In 1745 commenced the publication of the Biographia Britannica, one of the most important undertakings in which Campbell was engaged. The articles written by him, extending through four volumes of the work, are, both in point of style and matter, much superior to those of his coadjutors. They are liable, however, to one general censure arising from the almost unvarying strain of panegyric in which the writer indulges, and which has repeatedly subjected him to critical animadversion. In 1750 he published the Present State of Europe, containing much historical and political information. He was then employed on the modern part of the Universal History. His last and favourite work was a Political Survey of Great Britain (1774, two vols. 4to). Campbell died December 28, 1775.

CAMPBELL, John, Lord, Lord-chancellor of England, was the son of Dr. George Campbell, minister of Cupar-Fife, and born at Springfield, near that town, on Sept. 15, 1779. He was educated at the grammar-school of Cupar, and at the early age of twelve entered the University of St. Andrews in Nov. 1791, the same year with Dr. Chalmers, for the purpose, like him, of studying for the church. After remaining, however, for some years at college, he resolved to abandon the clerical for a more congenial profession, and determined to try his fortune in London. In 1798 he accordingly quitted his native country for the metropolis, and arriving there succeeded in obtaining, by the good offices of Mr. (afterwards Serjeant) Spankie, who was then its editor, the appointment of reporter and theatrical critic to the Morning Chronicle. Shortly afterwards he resolved to devote himself to the law, and in Nov. 1800 entered himself a student of Lincoln's Inn, and in 1806 was called to the bar. He travelled the Oxford circuit, and obtained considerable practice, besides making there the friendship of Mr. Serjeant Talfourd. In 1830 he succeeded in being elected as member for Stafford, and in 1832 was appointed solicitor-general. In 1834, on the retirement of Sir William Horne, he became attorney-general, and the same year, on the transfer of Jeffrey to the bench, was elected one of the members for the city of Edinburgh, a post which he continued to hold till 1841. In that year he was created Lord-chancellor of Ireland, and raised to the peerage by the title of Baron Campbell of St. Andrews. He had scarcely, however, assumed his official duties in Ireland when he quitted office with the Melbourne ministry; and having now more leisure on his hands, set himself to the composition of his Lives of the Chancellors, the first series of which was published early in 1846, and speedily became popular. On the accession of Lord John Russell to power in that year he accepted the chancellorship of the duchy of Lancaster, but still continued assiduously his literary labours, completing, in seven volumes, his Lives of the Chancellors, and adding two other supplemental volumes, entitled Lives of the Chief-justices of England. In 1850, on the retirement of Lord Denman, he was appointed chief-justice of the Queen's Bench, and in that capacity proved a most efficient judge. In 1859, on Lord Palmerston's re-accession to the premiership, Lord Campbell reached the highest legal dignity in the British empire, by being raised to the woolsack as lord-chancellor. After attaining the age of fourscore and upwards, with all his faculties, bodily and mental, in full vigour, he was found dead in his chair, on the morning of Sunday, 23d June, 1861.

CAMPBELL, Thomas, one of the most distinguished of modern poets, was born at Glasgow in 1777, and educated at its university, where he distinguished himself by the excellence of his poetical translations from the Greek. After leaving the university he resided for a short time in Edinburgh; and all at once attained the zenith of his fame by publishing, in 1799, his Pleasures of Hope. It produced an extraordinary sensation, and soon became a familiar book at almost every hearth throughout the kingdom where the beauties of true poetry were understood and appreciated. For this honour it was indebted not more to the graces of its style than the noble purity of its thoughts. After the publication of this poem he went over to Germany, where h met Klopstock at Hamburg, and visited the scene of the battle of Hohenlinden, celebrated in one of the most famous of his early poems. The appearance of the English fleet caused him to leave Altona, where he had resided for some time. During this tour several of his best lyrics were written or suggested, among them The Exile of Erin, Ye Mariners of England, and The Battle of the Baltic. In 1803 a new edition of the Pleasures of Hope and other poems appeared, and in that year too he married. Settling in London, he devoted himself to literary work, and in 1805 obtained a pension of £200, through the influence of Fox, of whose politics he was an admirer. After this he appears for a time to have given his attention less to poetry than prose, but in 1809 he again made his appearance as a poet, and published Gertrude of Wyoming, which some eminent critics have considered superior to the Pleasures of Hope, though the public appear to have judged differently. In 1814 he visited Paris, and in the following year he received a legacy of over £4000. In 1819, by his Specimens of the British Poets, accompanied with critical essays, he proved himself the possessor of great critical acumen and an admirable prose style. In 1820 he became editor of the New Monthly Magazine, a post which he held till 1830. In 1824 he published his poem Theodric, which, though not devoid of fine passages, scarcely sustained his reputation. For some years after he took an active interest in measures for the emancipation of Greece and Poland, and for the foundation of the London University, of which he considered himself the originator. He was elected rector of his native university in 1826–29. In 1828 his wife died, and thenceforth his vigour, both bodily and mental, began to decline; and though he afterwards published Letters from the South (1837), describing a visit which he had paid to Algiers, a Life of Mrs. Siddons (1834–42), and a Life of Petrarch, and either wrote or edited the Life and Times of Frederick the Great, he signally failed to equal his far more youthful efforts. In 1831–32 he was editor of the Metropolitan Magazine, and in 1832 he founded the Polish Association. Among works not mentioned above are: The Advent, a hymn; Love and Madness; Lord Ullin's Daughter; The Wounded Hussar; Gilderoy; The Soldier's Dream; Judith; The Name Unknown; The Turkish Lady; Lochiel's Warning; The Rainbow; The Last Man; Navarino; Pilgrim of Glencoe; Moonlight; &c. He died at Boulogne-sur-Mer on June 15th, 1844, and was interred at Poet's Corner in Westminster Abbey, close to the tomb of Addison. See the Life and Letters by Beattie (1840), and Redding's Literary Reminiscences of Campbell (1859).

CAMPBELTOWN, a royal and parl. burgh of Scotland, in Argyleshire, on the peninsula of Kintyre, at the head of an inlet of the sea about 2 miles in length by less than one in breadth, which appears quite landlocked by reason of a conical insular rock lying at its mouth, and intercepting the view of the sea. The passage into the bay is by the N. side of this rocky mass, which is called Island-Davar, and is attached to the mainland on the S. side by a spit of shingle. The town is mostly of modern erection, and lies round the head of the bay. It has county and town halls, a custom-house, &c., and an old granite cross, sculptured with foliage. In 1700 it was erected into a royal burgh, through the interest of the Argyle family, whose family name was conferred upon it in compliment. Anciently it was called Dalruadhain. There are many distilleries in the town and vicinity, and the trade consists chiefly in the export of whisky and farm produce. The herring-fishery is carried on, and there is a ship-building yard, from which iron vessels averaging from 1000 to 2500 tons are launched. Ropes, nets, &c., are also manufactured. Some coal is mined in the neighbourhood. It unites with Ayr, Irvine, Inverary, and Oban to return one member to Parliament. Pop. in 1881, 7693; in 1901, 8234.

CAMPE, Joachim Heinrich, a German author, born at Deensen (Brunswick) in 1746, studied for the church, acted for some time as a teacher in various positions, and in 1786 was chosen by the government of Brunswick to superintend and reform the schools of that duchy. He became likewise the head of a school-book publishing house at Brunswick, and his own works, which were issued from it, contributed greatly to extend its reputation. These consist principally of educational works and books for youth, the most successful being Robinson the Younger, an adaptation of Defoe's Robinson Crusoe. This attained an immense popularity, being translated into almost all the languages of Europe. Campe died on Oct. 22nd, 1818.

CAMPEACHY, or Campeche, a seaport town of Mexico, in the state and on the bay of the same name, on the W. coast of the peninsula of Yucatan, about 100 miles S.W. of Merida, with which it is connected by a railway. It contains a citadel, a university with a museum, a hospital, and a handsome theatre. Campeachy is an important mart for logwood or Campeachy wood, of which great quantities are exported. Other important exports are wax and henequen or sisal-hemp. Owing to the shallowness of the roadstead large vessels have to anchor 5 or 6 miles off. A lighthouse has recently been erected. Pop. (1895), 16,631. The State of Campeachy has an area of 18,087 sq. miles, and a pop. (1895) of 88,121. The *Bay of Campeachy*, part of the Gulf of Mexico, lies on the S.W. of the peninsula of Yucatan, and on the N. of the province of Tabasco.

CAMPEGGI, or Campeggio, Lorenzo, Cardinal, born in 1474, succeeded his father as professor of law in the University of Padua in 1511, and gained a high reputation. When holding this office he married, and became the father of several children; but having lost his wife, took orders, and in a short period rose to be a distinguished ecclesiastic. Pope Julius II. made him Bishop of Feltri, and Leo X., after giving him a cardinal's hat, employed him on several important missions, the execution of which gave him some prominence in connection with the Reformation. One of his missions was to Germany, for the purpose of regaining Luther; and another to England, to attempt to levy a tithe for defraying the expense of a war against the Turks. He failed signally in both; but during the latter, so far ingratiated himself with Henry VIII. as to be made Bishop of Salisbury. Under Clement VII. he was sent as legate to the diet of Nürnberg, where he vainly endeavoured to unite the princes in opposition to Luther; and to the diet of Augsburg, where he had the mortification of witnessing the delivery of the celebrated Confession which bears its name. He again visited England, with extensive powers to decide in the question of divorce between Henry VIII. and his queen Catherine; but his temporizing measures lost him the confidence of all parties, and he was obliged to return shorn of his bishopric of Salisbury. Notwithstanding his repeated failures, he managed to remain high in favour at the papal court; and at his death, in 1539, was archbishop of his native town, Bologna.

CAMPEN, or Kampen, a town and port of Holland, in the province of Overijssel, 45 miles E.N.E. of Amsterdam, on the Ijssel near its influx into the Zuiderzee, and where it is crossed by a bridge. It has four old gates, and the remains of its former defences have been converted into fine promenades. Its principal buildings are a church of the 14th century, an elegant townhouse, built in an antique style, and a custom-house. Anciently it was one of the most flourishing of the Hanse towns; and its commerce after a period of decline has again to some extent revived. Its manufactures also suffered, but it still produces machinery, steam-engines, hosiery, cigars, &c. It has also ship-building yards. Several canals intersect it, and a railway line from Germany through Zwolle terminates here. Campen is said to have been the birthplace of Thomas à Kempis. Pop. (1892) 18,908.

CAMPEN, or KAMPEN, JACOB DE, a leader of the Anabaptists, who, when driven out of Upper Germany, attempted to diffuse their dogmas over the Low Countries. In 1534 John of Leyden nominated him Bishop of Amsterdam. He went to take possession of his see, but met with a cruel death at the hands of the people.

CAMPEN, JAN VAN, so called from the town of Campen, in Holland, where he was born about 1490, was professor of Hebrew at Louvain from 1519 to 1531. He travelled much throughout Europe, and died of the plague at Friburg in 1538. He wrote a Latin paraphrase of the Psalms, which has been translated into the chief European languages.

CAMPER, PETER, physician and anatomist, was born at Leyden in 1722, and died at the Hague on April 7, 1789. He distinguished himself in anatomy, surgery, obstetrics, and medical jurisprudence, and also as a writer on the beautiful. From 1750 to 1755 he was professor of medicine at Franeker, and from the latter year to 1763 at Amsterdam. Henceforth till his resignation in 1773 he held a professorship at Groningen. His Dissertation on the Natural Varieties, &c., is the first work in which was thrown much light on the varieties of the human species, which the author distinguishes by the shape of the skull. His Treatise on the Natural Difference of Features in Persons of various Countries and Ages, and on Beauty as exhibited in Ancient Paintings and Engravings, followed by a method of delineating various sorts of heads with accuracy, is intended to prove that the rules laid down by the most celebrated limners and painters are very defective. His general doctrine is, that the difference in form and cast of countenance proceeds from the facial angle. See FACE.

CAMPERDOWN, or CAMPERDUIN, a stretch of sandy hills or downs in Holland, province North Holland, between the North Sea and the small village of Camp, off which the British, under Admiral Duncan, gained a hard-won victory over the Dutch, under De Winter, October 11, 1797. For this victory Admiral Duncan was raised to the peerage as Viscount Duncan of Camperdown. His son became Earl of Camperdown, and this title still belongs to a descendant.

CAMPHOR is a white resinous substance, of peculiar and powerful smell, extracted from two or three kinds of trees of the laurel tribe, that grow in the islands of the East Indies and China. Of these the principal is the *Laurus* (*Cinnamomum*) *camphora* of Japan, Formosa, and China. It is of considerable height, much branched, and has ovate, acuminate, smooth, ribbed leaves, of a pale yellowish-green colour on the upper side, and bluish-green beneath. The flowers are small, white, and stand on stalks which issue from the junction of the leaves and branches. Camphor is found in every part of the trees; in the interstices of the perpendicular fibres, and in the veins of the wood, in the crevices and knots, in the pith, and in the roots, which afford by far the greatest abundance. The method of extracting it consists in distilling with water in large iro pots, which serve as the body of the still, wit earthen heads fitted to them, stuffed with straw, an provided with receivers. Most of the camphor con denses in the solid form among the straw, and par comes over with the water. Its sublimation is per formed in low, flat-bottomed glass vessels, placed i sand, and the camphor becomes concrete, in a pur state, against the upper part, whence it is afterward separated with a knife, after breaking the glass.

Numerous other plants are found to yield cam phor or its isomerides by distillation. Among then are rosemary, lavender, the common sage, spike feverfew, chamomile, hyssop, elecampane, nutmeg cowbane, pennyroyal, wormword, and pichurim beans A smell of camphor is disengaged when the volatil oil of fennel is treated with acids; and a small quantity of camphor may be obtained from oil of turpentine by simple distillation, at a very gentle heat.

Camphor has a bitterish, aromatic taste, is unctuous to the touch, and possesses a degree of toughness which prevents it from being pulverized with facility, until a few drops of alcohol be added, when it is easily reduced to a powder. It floats on water, and is exceedingly volatile, being gradually dissipated in vapour if kept in open vessels. Its melting point is 347°, and it boils at 400° Fahrenheit. It is very slightly soluble in water, and when thrown upon it executes a series of rapid motions, which, however, cease if a drop of oil be added. It is dissolved freely by alcohol, from which it is immediately precipitated, in milky clouds, on the addition of water. It is likewise soluble in the fixed and volatile oils, and in strong acetic acid. Sulphuric acid decomposes camphor, converting it into a substance like artificial tannin. With nitric acid it yields a peculiar acid, called camphoric acid. This acid combines with alkalies and forms salts, called camphorates. The alcoholic solution of camphor turns the plane of polarized light to the right. There are two other camphors, one of which has an equal but opposite rotatory effect; the other is inactive.

In a wider sense the term camphor is applied to a large class of oxygen-derivatives of hydrocarbons obtained from many plants by distillation and other processes. The chief of these are peppermint camphor or menthol ($C_{10}H_{18}.OH_2$), borneol or Borneo camphor ($C_{10}H_{16}.OH_2$), thymol or thyme camphor ($C_{10}H_{14}O$), and the common laurel camphor ($C_{10}H_{14}.O_2$). Borneo camphor is produced by a large dipteraceous tree (*Dryobalanops aromatica*) found in Borneo, Labuan, and Sumatra. It occurs in longitudinal fissures in the old wood, from which it can be obtained only after cutting down the tree. Rosemary, a species of Aristolochia (birth-root), and valerian (*Valeriana officinalis*) also contain it. It melts at 403° F. and boils at 414°; is rather heavier than water, in which it dissolves sparingly; and rotates the plane of polarization to the right. By oxidation it yields ordinary camphor, which may again be converted into borneol by means of a reducing agent. Borneo camphor is harder and less volatile than common camphor. Thymol is obtained from species of thyme and other plants, and is used as an antiseptic. Peppermint camphor or menthol, much used in medicine as a local anæsthetic and otherwise, occurs in species of mint.

Camphor is used medicinally to a considerable extent. It stimulates the skin, and is a powerful irritant to raw surfaces and mucous membranes. On this account it is employed in liniments, and is applied to sprains, and painful or enlarged joints. Its stimulating properties make it useful when taken internally for flatulence and diarrhœa, in hysterical vomiting, in the prostration of fevers, in poisoning by opium, and in various nervous affections. In combination with other substances it is often used as a cough mixture (in paregoric elixir for instance). In large doses it acts as a poison. Its effluvia are very noxious to insects, and hence it is much used to preserve objects of natural history.

CAMPHUYSEN, Dirk Rafaelz, one of the most celebrated landscape-painters, born at Gorkum in 1586; died at Dockum in Friesland, July 9, 1627. He studied under Govertz, and soon rose to eminence. No painter has succeeded better in representing sunset and winter. He is remarkably true to nature, and his hoar-frost, ice, and trees stripped of their foliage, are given with the most vivid reality. No Dutch painter up to this time appears to have thoroughly understood the mode of treating landscapes, and he has the merit of being the earliest, and at the same time the most finished model. He also excelled in painting modern architecture. His works are in high repute, but extremely rare. Instead of confining his attention to his art, he unfortunately thought himself fit to be a theologian, and engaged in discussions in which he is only remarkable for the serious blunders into which he fell, and the troubles in which he involved himself. After studying at Leyden under Arminius, he became, first a Mennonite, and then a Socinian. His theological works were collected and published in one vol. 4to.

CAMPIAN, Edmund, born in London in 1540, was educated at Christchurch Hospital, and became so good a scholar, that he was selected to deliver Latin addresses both to Mary and Elizabeth, on their accession to the throne. He was afterwards selected to the same office at Oxford on the visit of Elizabeth to the University, and maintained a thesis in her presence with distinguished success. He took orders in the English Church, but shortly after retired to Ireland and became a Roman Catholic. His connection with the leading Catholics of that kingdom brought him under the suspicion of the government, and he withdrew to the Continent, where he was employed for some time as a professor in the English college at Douay. He afterwards went to Rome, and, having turned Jesuit, was employed by his order in teaching and preaching at Prague and Vienna. In 1580 he returned to England with Parsons, at the head of a body of Jesuits, by means of whom the pope vainly hoped to reconquer it; and shortly after he seems to have published an anonymous work, entitled Rabsaces Romanus, in which he challenged the Protestant clergy to a discussion of ten leading points in the Romish controversy. He was ultimately arrested, arraigned on a charge of treason, condemned, and executed with three of his accomplices at Tyburn in 1581.

CAMPION. See Lychnis and Silene.

CAMPLI, a town in Naples, Kingdom of Italy, in the province of Teramo, and 5 miles N. of the town of Teramo. It has a cathedral, three churches, an abbey, several convents, an hospital, and a mont-de-piété. Pop. 7236.

CAMPOBASSO, a town of Italy, chief town in the province of Molise, on a hill-slope, 52 miles N.E. of Naples. It is fortified, and is the seat of criminal and civil courts; has a collegiate church, four parish churches, several convents, two colleges, an hospital, and an almshouse. The cutlery manufactured here is said to be the best in Naples. The town is favourably placed for business, on the road from the capital to the Adriatic. Two fairs are held annually. Pop. (1881), 14,818.

CAMPO-FORMIO, or Campo Formido, a town in Italy, province of Udine, 66 miles N.E. of Venice, famous for the treaty of peace between Austria and France, which was signed in its neighbourhood on the 17th October, 1797.

CAMPO-MAIOR, a fortified town, Portugal, in the province of Alentejo, on the Spanish frontiers, 15 miles N.W. of Badajoz. It possesses some strength, but is otherwise a poor place, with narrow, dirty streets. Pop. (1890), 5846.

CAMPOMANES (Don Pedro Rodriguez), Count of, a celebrated Spanish politician and author, born 1723, died 1802. Among his numerous works are A Dissertation on the Templars; another on the Commercial Antiquity of Carthage; A Treatise on the Sources of Popular Industries; and a Treatise on the Education of Artisans, besides a sequel to the latter work, which treats of the causes of the decline of the arts in Spain.

CAMPUS MARTIUS (called also, by way of eminence, *Campus*, merely) was a large place in the suburbs of ancient Rome, consisting of the level ground between the Quirinal, Capitoline, and Pincian hills, and the river Tiber. From the earliest times it seems to have been sacred to the god Mars, from which circumstance it received its name. It was originally set apart for military exercises and contests, as also for the meetings of the comitia by tribes and by centuries. In the later period of the republic, and during the empire, it was a suburban pleasure-ground for the Romans, and was laid out with gardens, shady walks, baths, &c.

CAMPVERE, now *Veere*, *Vere*, or *Ter-Vere*, a maritime town in Holland, in the province of Zeeland, and the island of Walcheren, 4 miles N.N.E. of Middelburg, on the Veerschegat, a sea-arm which separates Walcheren from the island of North Beveland. It is fortified, entered by four gates, has a harbour, a town-house, and a market-place, but its trade has greatly decreased. It is historically interesting as being a place where the Scotch had a separate community and various privileges. Pop. 900.

CAMWOOD, a red dye-wood obtained in Brazil and also in Africa. It once was common in the neighbourhood of Sierra Leone, and was also found in Tonquin and other parts of Asia. This wood is of a very fine colour, and is principally used in turnery for making knife handles and other similar articles. The dye obtained from it is brilliant, but not permanent.

CANAAN. See Palestine.

CANADA, Dominion of, an extensive series of British territories in North America, the greatest of Britain's colonial possessions, comprising the provinces of Ontario (formerly Upper Canada), Quebec (formerly Lower Canada), Nova Scotia, New Brunswick, British Columbia, Prince Edward Island, and Manitoba, along with a vast region in the north-west known as the North-west Territories, and certain other vast regions not as yet under a regularly organized system of government. The Dominion thus embraces the whole of British North America, with the exception of Newfoundland and part of Labrador (which belongs to Newfoundland), and its area is not much less than that of Europe. The following table shows the present areas of the provinces of the Dominion, with their populations on the 3rd of April, 1891 and 1901. The total population in 1871 was 3,686,013.

Provinces.	Area in sq miles	Pop. in 1891.	Pop in 1901
Ontario	222,000	2,112,989	2,167,978
Quebec	228,900	1,488.586	1,620,974
New Brunswick	28,200	321,294	331,093
Nova Scotia	20,600	450,523	459,116
Manitoba	73.956	154.442	246,464
British Columbia	383,300	92,767	190,000
Prince Edward Island	2,000	109,088	103.258
North-west Territories, &c.	2,497,427	99,722	220,000
Dominion of Canada	3,456,383	4,829,411	5,338,883

Nova Scotia, New Brunswick, and Prince Edward Island are called the 'Maritime Provinces', though British Columbia is also a maritime province. In the North-west Territories are four organized districts: Assiniboia, area 89,535 sq. miles; Saskatchewan, 107,092 sq. miles; Alberta, 106,100 sq. miles; Athabasca, 104,500 sq. miles. There are also the districts of Keewatin (subordinate to Manitoba), Yükon, Mackenzie, Franklin, and Ungava. The boundaries are: the Atlantic on the east, the United States on the south, the Pacific and Alaska on the west, and the Arctic Ocean on the north.

Coasts.—On the east the coast-line is very irregular, being marked by deep indentations and fringed by islands. The province of Nova Scotia forms an odd peninsular projection with the Bay of Fundy between it and the mainland, while north of it is the Gulf of St. Lawrence, shut in from the Atlantic by Cape Breton Island and Newfoundland. In the gulf are the island of Anticosti and Prince Edward Island. The chief features of the north coast are the archipelago of the Arctic islands and the great opening of Hudson Bay, connected with the Atlantic by Hudson Strait, and having as its southern continuation James Bay. On the west coast are Vancouver Island, the Queen Charlotte Islands, and many others. The southern boundary is most remarkable for passing through the system of great lakes—Superior, Huron, Erie, and Ontario, between the last two of which are the falls of Niagara, partly belonging to Canada, partly to the United States. To the Atlantic the drainage of these lakes is carried by the St. Lawrence, with which river, and the great gulf into which it expands, are connected the provinces of Ontario, Quebec, New Brunswick, Nova Scotia, and Prince Edward Island, together containing by far the greater portion of the population of the Dominion.

Surface.—With regard to the character of the surface, Canada may be divided roughly into three great regions: a region of woodlands and hills or undulating ground in the east, an immense region of prairies in the middle, and a mountainous forest region in the west. The chief mountain ranges of the east are north and south of the St. Lawrence, and run nearly parallel to that river. On the south are the Shickshock Mountains and the Notre Dame Range, the former rising to the height of 4000 feet. On the north is the Laurentian Range (perhaps attaining 4000 feet), running in a westerly direction from the Labrador coast to the Ottawa River, and forming the watershed between the rivers which flow into the St. Lawrence and those which flow into Hudson Bay. The prairie region and great wheat-producing tract extends north-west of Lake Superior to the Rocky Mountains. This is a great region of plains, with low hills in some places; it is well wooded in many parts, elsewhere bare or with an agreeable mixture of woodland and prairie. Some portions are decidedly infertile, but their area is small compared with the whole. On the Pacific slope we have a distinctly mountainous region, including the Rockies, some peaks of which (Mt. Hooker, Mt. Brown) attain a height of about 16,000 feet, as also the Gold and the Cascade Ranges. This region, with its high mountains, deep gorges or canyons, large and rapid rivers, long and narrow lakes, great forests of gigantic trees, and its narrow fiords or inlets, presents an aspect peculiar to itself.

Lakes and Rivers.—The vast lake and river systems which Canada possesses of its own, or shares with the United States, give it a unique character. Everywhere in the interior are rivers and lakes. To Hudson Bay flow the Albany, Nelson, Churchill, and many other streams; to the Arctic Ocean, the Mackenzie, Coppermine, and Back or Great Fish River; to the Pacific, the Fraser, Skeena, Stickeen, &c. The basin of the St. Lawrence, with the connected lakes Superior, Huron, Michigan, Erie, and Ontario, affords a continuous waterway from the Atlantic to the interior of the continent. To this system belong the Ottawa, Gatineau, Richelieu, St. Maurice, Saguenay, and other rivers. In the prairie region and the north-west are similar great lake and river systems, formed by the Saskatchewan, Nelson, Churchill, Athabasca, and Mackenzie rivers, and the great lakes Winnipeg, Athabasca, Great Slave, and Great Bear. The Saskatchewan, lying in the heart of the rich wheat-growing district, must in time prove a far more important waterway than at present. The Mackenzie and its connected lakes and rivers form the most remarkable feature of the far north-west. This river, including its tributary the Peace, has a length of perhaps 2500 miles, and drains an area of 550,000 sq. miles, or almost double that of the St. Lawrence basin. Between the Mackenzie system and Hudson Bay is a great region called from its desolate character the Barren Grounds.

Geology and Minerals.—As regards the geological features of Canada, great part of the Dominion north of the St. Lawrence and west of Hudson Bay is covered with archæan rocks belonging to the Laurentian system, and consisting largely of granite and gneiss, with quartz-rock, schist, limestone, &c. South of the St. Lawrence, in New Brunswick and Nova Scotia, is a considerable development of Carboniferous strata. Between the archæan rocks and the Rocky Mountains is a great area of secondary (Mesozoic) strata. In the Rocky Mountain region the archæan, palæozoic, mesozoic, and tertiary systems are represented. Canada has great mineral wealth. Iron of the best quality has been found in great abundance in Quebec, Ontario, and British Columbia. The district round Lake Superior and the upper part of Lake Huron abounds in copper, and has much silver as well; and Nova Scotia, Assiniboia, Alberta, and British Columbia are rich in coal. In Nova Scotia there are a number of coal-mines worked; gold is also obtained in some quantity, as well as iron. Coal is worked in the north-west, and more extensively in British Columbia, which is also rich in iron; but the most valuable mineral of the latter is gold. Much gold has latterly been obtained on the Klondyke, near Alaska. Large quantities of petroleum are obtained. The chief oil district is the peninsula in the province of Ontario formed by Lakes Erie and Huron and the River St. Clair. Other useful mineral products are salt, gypsum, phosphate of lime, slate, asbestos, plumbago, antimony, and building-stone.

Animals.—The chief wild animals (some of them represented by several species) are the deer, buffalo, musk-ox, bear, wolf, fox, otter, beaver, squirrel, raccoon, musk-rat, marten, &c. The buffalo is now scarce, and will probably soon be exterminated. The largest of the deer kind is the moose, or elk, which is found in New Brunswick, Nova Scotia, and the northern parts of Quebec, as well as in the far west and north-west. The reindeer occurs in the north. The grizzly bear is met with in the Rocky Mountains, and the polar bear in the extreme north and north-east. Fur-bearing animals are so numerous as to have been a source of revenue to a large trading company like the Hudson Bay Co. for over two centuries. There are birds in great variety, Canada having more than 700 of these altogether. They include the wild swan, wild turkey, geese and ducks of various kinds, partridges, quail, prairie-fowl, pigeon, woodcock, snipe, plover, &c.; besides eagles, hawks, owls, and many smaller birds, among which

are two species of humming-bird. Except at certain seasons game of all kinds may be shot at will. The rattle-snake and other snakes occur, but are less common than in the States. The seas, lakes, and rivers, especially the Gulf of St. Lawrence and the neighbouring waters, abound in almost all kinds of fish, and the fisheries are extremely valuable, employing over 250,000 people. The chief sea-fish caught are cod, herring, mackerel, halibut, haddock, hake, shad, salmon, &c. The rivers and lakes abound with salmon, white-fish, bass, trout, sturgeon, maskinonge (or maskelonge), pike, pickerel, &c. The seal and whale fisheries are also valuable. Lobsters and oysters are abundant and excellent.

Vegetation.—The forests are of great extent, and the timber trade is a great source of wealth, the value of the timber and forest products shipped to Great Britain being annually £4,000,000. In the forests grow more than sixty kinds of trees. Amongst the most valuable are the white and red pine, white and black spruce, maple, ash, beech, oak, walnut, butternut, chestnut, basswood, birch, cedar, &c. Over most parts of the Dominion (except in the prairie regions of the interior) good timber is found, though in the older and more closely-settled parts the forests have been largely cleared off. The forests of British Columbia produce the largest timber, the Douglas pine being the chief tree. The balsam poplar grows to an immense size on the Athabasca, Peace, and Mackenzie rivers, and even at the mouth of the last, within the Arctic circle, trees of some size are found. The Banksian pine grows to the height of 100 feet on the southern shores of Hudson Bay; and spruce suitable for building purposes, and the tamarac or larch, extend as far north as Fort George on its east and Fort Churchill on its west shore. The sugar-maple, a forest tree attaining the height of 120 feet, flourishes in the greater part of the St. Lawrence valley up to latitude 49°, and is much valued for the sugar that is obtained from it. There are a great many varieties of wild fruits, as the wild plum, wild cherry, raspberry, service-berry, cranberry, gooseberry, strawberry, black and red currant, wild vine, blueberry, buffalo-berry, &c., and numerous wild flowers and flowering shrubs. Of the wild fruits, the raspberry, the cranberry, and the blueberry are alone important economically. There are rich pasture grasses, but they cannot be utilized in cultivation.

Climate.—The climate of a country of such vast extent and varied features as Canada naturally differs very much in different places, and in this respect British Columbia on the Pacific coast, and Nova Scotia and the other Atlantic regions, are very dissimilar to the prairie region of the centre. So different, indeed, is the climate of one portion of the Dominion from that of other portions, that Canada has been said to present 'climates and productions similar to those of north-west and central Europe—that is, of Russia, Norway, the British Islands, Denmark, Germany, France, Holland, Belgium, Switzerland, and Northern Italy.' In Ontario and the region of the Upper St. Lawrence it may be described as temperate, although the heat in summer and the cold in winter are on the average twenty degrees greater than the corresponding seasons in Great Britain. Generally the climate of the Dominion shows considerable extremes of heat and cold, but, except in some of the coast regions, the exceeding dryness of the Canadian atmosphere makes both extremes of temperature more pleasant and healthy than similar temperatures in Britain. Apart from the portions of the Dominion that fall within the Arctic Circle, Labrador and all the country east of Hudson Bay have the most severe climate. The Pacific coast region has a decidedly moist climate. The peninsula lying between Lakes Ontario, Erie, and Huron has the finest climate, allowing of fruits, shrubs, and flowers to be grown that cannot stand the winter elsewhere. The Mackenzie River district—especially in the region of the Peace River, where the temperature throughout the year is remarkably genial—possesses a climate much less severe than one might expect, and would allow of agriculture almost to the Arctic Ocean.

Agriculture.—Both by soil and climate Canada is specially adapted for agriculture. Within the last few years its agricultural importance has greatly increased, and when the great prairies are brought under cultivation Canada will be one of the chief agricultural countries in the world. In general, sowing is later than in the northern parts of Britain, but the harvest is gathered earlier, a large part of it usually before the end of July, so rapid is the growth during the hot Canadian summer. The chief crops are wheat, barley, oats, rye, pease, maize, buckwheat, potatoes, turnips, mangel-wurzel, &c. The breeds of cattle are now being much improved, partly by the introduction of high-class cattle from Britain; and cattle, horses, and sheep are exported. The total value of all exports connected with agriculture, including grain, flour, animals, and animal products (as cheese, eggs, &c.), was £15,000,000 in 1898. The province of Ontario has an agricultural college and model farm at Guelph, and there are also model farms in Quebec. Fruit-growing is now an important industry in certain localities, and large quantities of apples are exported, as well as canned and dried fruits. Peaches are grown to most advantage in the Niagara district of Ontario, where peach orchards many acres in extent are to be seen. The vine is cultivated too, and good wine is made. Pears, plums, and many kinds of berry fruits, &c., are produced in great perfection.

Commerce.—The trade of the Dominion is chiefly with Great Britain and the United States. About four-fifths of the whole exports are sent to these two countries, while nearly nine-tenths of the imports come from them, sometimes more than one-half being from Great Britain alone. Besides timber, animals and their produce, and agricultural products, the chief articles of export are fish, coal and other minerals, leather, and wooden goods. The total exports in 1898 were valued at £31,897,150, the imports at £28,061,200. The imports chiefly consist of manufactured goods, coal, iron, tea, coffee, sugar, cotton, &c. Besides cereal products and timber, Great Britain receives many live cattle, large quantities of bacon and hams, cheese, butter, furs, and fish. The principal imports of British produce are iron, wrought and unwrought, woollen goods, cottons, apparel and other textiles, &c. The value of Britain's imports from Canada in 1898 was £20,403,610. Among ship-owning countries Canada comes after Britain, the U. States, and Norway. A uniform decimal system of coinage was established throughout the Dominion in 1871. The unit of account is the dollar of 100 cents, the value of which is declared to be on the basis of 486 cents and two-thirds of a cent to the pound of British sterling money. The average rate of exchange makes the dollar equal to about 4*s.* The money used consists of bank bills, and gold, silver, and bronze coins, besides government notes of small denominations up to 4 dollars, the bank bills being not of lower denominations than 5 dollars. There is a uniform system of weights and measures, the Canadian standards being the same as the British imperial standards. The British hundredweight of 112 lbs. and ton of 2240 lbs. are, however, superseded by the United States weights of 100 lbs. and 2000 lbs. respectively.

Railways.—The inland trade of Canada has been much improved by the completion of the various lines of railway, and is also greatly furthered by the extensive system of canals. Of the railways the greatest is the Canadian Pacific Railway, running from Montreal across the whole continent to Vancouver on the Pacific coast in British Columbia; length, about 2900 miles, exclusive of branches. (See CANADIAN PACIFIC RAILWAY.) The Grand Trunk Railway, which crosses the St. Lawrence at Montreal by the stupendous Victoria Bridge (with its abutments nearly 2 miles long), connects the Maritime Provinces and the North-eastern United States with the western railways. Other important railways are the Intercolonial Railway from Halifax in Nova Scotia to Quebec, Montreal, &c.; and the Canada Atlantic Railway, giving a very direct route between the seaboard and the great lakes. Altogether the Dominion has now about 17,000 miles of railway. It has been proposed to construct a railway from Winnipeg to Hudson Bay, and thus to open up a shorter (summer) route from Britain to the centre of the continent than any yet existing. From Winnipeg there is direct railway communication with the Western United States, and this town is now an important centre of river navigation, steamers running up the Red River into the States, up the Assiniboine, and through Lake Winnipeg and up the Saskatchewan for 1500 miles.

Canals.—Some of the canals are stupendous achievements. The most important, from a commercial point of view, are the St. Lawrence Canals and the Welland Canal. The former series of canals, with an aggregate length of about 70 miles, avoids the rapids on the St. Lawrence between Montreal and Kingston on Lake Ontario, and thus affords to vessels the means of ascending to that lake (in descending vessels of 700 tons can shoot the rapids with safety); and the latter, which has a length of 27 miles, avoids the Niagara Falls and rapids, and enables vessels to ascend from Lake Ontario to Lake Erie. Both the Welland Canal and the St. Lawrence series have been enlarged and deepened so as to accomodate the increased traffic expected as a result of the settlement of the north-western provinces, and the construction of the Canadian Pacific Railway. The last Canadian canal necessary to complete the navigation of the St. Lawrence to Lake Superior is St. Mary's Canal, opened in 1895 at a cost of £750,000, avoiding the St. Mary rapids (Sault Ste. Marie), by which Lake Superior pours its waters into Lake Huron. Next after those mentioned, the most important of the Canadian canals is the series of locks and short artificial connections known as the Rideau Canal. It connects Lake Ontario at Kingston with the Ottawa near the city of that name. By means of these works large vessels can now sail by the St. Lawrence route from the Atlantic to the head of Lake Superior.

Constitution, &c.—By the Act of Confederation of 1867 the constitution of the Dominion was required to be similar in principle to that of the United Kingdom. There is a central federal government and separate provincial governments and legislatures. The central executive government is vested in the sovereign of Great Britain and Ireland, and is carried on in her name by a governor-general appointed by the crown, and a privy-council. The governor-general has a salary of £10,000 per annum. He is assisted by a privy-council consisting of the prime-minister and twelve other ministers or heads of departments. The legislative authority rests with a Parliament consisting of two houses, the Senate and the House of Commons. The Senate now consists of eighty members, who are nominated by the governor-general. Each senator must be a born or naturalized subject, thirty years of age, and possessed of real or personal property to the value of at least 4000 dollars in the province for which he is appointed. There are twenty-four senators from the province of Ontario, twenty-four from Quebec, ten from Nova Scotia, ten from New Brunswick, three from Manitoba, three from British Columbia, four from Prince Edward Island, and two from the territories. The House of Commons is elected by the people for five years, and at present consists of 215 members. There is a uniform franchise, a vote being given to every male of twenty-one years of age, possessed of a small property qualification. Each of the provinces has a separate parliament and administration, independent in its own sphere, at the head being a lieutenant-governor appointed by the central government. Ontario, Manitoba, and British Columbia have only one chamber; the other provinces have two. There is a very perfect system of municipal government throughout the Dominion, the counties and townships having local governments or councils which regulate their local taxation. The administration of justice is based on the English model, except in Quebec Province, where the old French law prevails. The only court that has jurisdiction throughout the Dominion (except the Exchequer and the Maritime Court) is the Supreme Court, the ultimate court of appeal in civil and criminal cases. In certain cases an appeal may be had to Her Majesty's Privy Council. The capital of the Dominion is Ottawa, but the largest cities are Montreal, Toronto, and Quebec. The Dominion revenue and expenditure are now each about £8,000,000 annually, the debt is about £67,000,000. Canada has both a large volunteer force and a militia. The former comprises many well-equipped organizations in infantry, cavalry, and artillery. A military college for the training of officers is maintained by the Dominion government at Kingston.

Religion and Education.—There is no state church in the Dominion. The prevailing religion in Quebec is that of the Roman Catholic Church. In Ontario Methodists predominate, then Presbyterians, the English Church, and the Roman Catholics. Of the total population in 1891, 1,990,465 were Roman Catholics, 847,469 Methodists, 755,199 Presbyterians, 644,106 Anglicans. Education is well attended to, being everywhere more or less under the supervision of government, and excellent free schools being provided. In Ontario, Quebec, and the N.W. Provinces separate schools are provided for Roman Catholics; in the other provinces the schools are unsectarian. All the provinces except British Columbia have universities or colleges, and the provision made for higher education in general is exceptionally good, a fact which is said to have an observable influence on the tone of the periodical press.

Literature.—In literature proper Canada, as yet mainly occupied with its material development, has scarcely had time to produce writers of a distinctively national type of style and thought. But in poetry, fiction, philosophy, Canadian history, and descriptive narrative, there is no lack of writers who reflect the highest thought and culture of Europe. The French-Canadian literature of Lower Canada, though entirely dependent for its inspiration and models on the literature of France, deserves notice as containing some valuable works on Canadian history and an interesting collection of essays, novels, and lyrics. Amongst the works which will give the reader some general idea of Canadian authors and their work, we may mention Lareau's Historie de la Littérature Canadienne, Grant's Picturesque Canada, Morgan's Bibliotheca Canadensis, and Canadian History and Literature by Withrow and Adam.

People.—The population is increasing rapidly both naturally and by means of immigration. In the years 1886-90 the increase in the latter way was 409,111. The nationality of the inhabitants is varied. Ontario is settled principally by emigrants from Great Britain and their descendants, with considerable numbers of Germans and Americans. In the province of Quebec the people are mostly French in origin, speech, and customs, being mainly descendants of the French colonists who inhabited the region before it became British. There are, besides, the Indian tribes and the Esquimaux, the latter in the extreme north. The Indians are estimated to number about 125,000. They are divided into various tribes as well as larger stocks or races, such as the Tinneh or Athabascan Indians, the Thlinkets and Hydahs of British Columbia and the west coast, the Algonquins, Hurons, Iroquois, &c., of the St. Lawrence region. In the old provinces separate land allotments have been granted to the Indian population, and there the Indians have adopted a settled mode of life, and have made considerable advances in civilization. A separate department of the Canadian government exercises a general supervision over their affairs. Schools have been established among them, and they are said to learn to read and write quickly and to show some talent for music and drawing. The majority of the Indians, however, live beyond the influences of this kind of civilization, and wander over the plains of the north-west supporting themselves by fishing and hunting, carrying their furs to the various forts or trading stations of the Hudson Bay Company. They also make a number of articles out of wood, such as dishes, shovels, &c. Their canoes are ingeniously constructed of birch bark, and are made light enough to be carried for miles by a man or woman over the roughest *portages*, or places intervening between one navigable point and another. Frequently, however, the canoe is in a single piece, made by hollowing out the stem of a tree. Their dwellings or *wigwams* are of the simplest construction, consisting merely of a frame of poles covered with birch bark, with a hole in the roof to serve for a chimney, and an opening covered with a blanket to serve for a door. There are also many half-breeds of mingled white (especially French) and Indian blood. These are intelligent and industrious, and engage in agriculture and other occupations, and usually speak a sort of corrupt French patois.

History.—English ships were the first to reach the shores of what is now Canada. In 1497 John Cabot, sailing from Bristol, landed on the coast of Labrador, and planted the English flag there. But it was the French navigator Jacques Cartier, who, in 1534, first really opened up Canada for European settlers. Some years later he landed with 200 colonists, but after struggling for two winters they were compelled to return. For the next fifty years no further attempts were made in these regions, except that on the part of the English, Martin Frobisher in 1576, and Sir Humphrey Gilbert in 1583, explored and took formal possession of Newfoundland and the adjacent coasts; while in 1603 Samuel Champlain, a French naval officer, made a settlement at Port Royal in Acadia (New Brunswick and Nova Scotia), which was soon afterwards abandoned. At length, in 1608, a French colony under the leadership of Champlain and Des Monts settled at Quebec. Two years later another English navigator, Henry Hudson, explored the river and the bay which bear his name. In 1627, Cardinal Richelieu organized the company of the Hundred Associates for the further colonization of New France. The most formidable foes of the colonists, whose number in 1663 was still under 2000, were the Iroquois Indians, who swarmed round the settlements. In 1663, Colbert being at the head of affairs in France, fresh supplies of emigrants and a strong body of troops were sent out to Canada. The Iroquois found it advisable to make peace, and the soldiers, turning colonists, received grants of land. In 1682, however, a new war with the Iroquois broke out, in which the colonists, at first successful, latterly suffered severely in the massacre of Lachine.

The French colonists had scarcely recovered from this blow when war broke out between France and England. The French struck the first blow by the burning of the British settlement at Corlaer (now Schenectady) and the massacre of its inhabitants. The British colonists retaliated; but the Peace of Ryswick put an end to the war. In 1702 a new conflict arose, terminating in 1713 with the Peace of Utrecht, by which the British obtained Acadia, Newfoundland, and the regions around Hudson Bay, France retaining Canada, Cape Breton, &c. In the thirty years of peace which followed the French did not altogether neglect industrial development, but in general their colonists lacked the qualifications for agricultural and other settled pursuits. The British colonists, on the other hand, stuck to agriculture, and reclaimed every year great tracts of forest land. As a natural consequence their population rapidly increased, and when the final struggle began, the British colonies in America numbered three millions of prosperous inhabitants against some sixty thousand French colonists. In 1754 the French governor, Du Quesne, an energetic and aggressive man, established new military posts in the Ohio Valley, and seized a newly-built British stockade on the spot where Pittsburg now stands. As the result of this action both sides prepared for war. The English government sent out two regiments under General Braddock, who allowed himself to be surprised and routed near the Monongahela; but an expedition against Crown Point under the leadership of General William Johnson drove the French within their intrenched camp at Ticonderoga. Now happened the incident of the expulsion of the Acadian peasants (immortalized in Longfellow's Evangeline), of whom about seven thousand still remained in Nova Scotia, mostly on the shores of the Bay of Fundy. They refused to swear allegiance to the British government, and some of them took part in the Indian raids against the British settlements. On these grounds the council at Halifax resolved upon the expulson of the whole French population, and the measure was thoroughly carried into effect. The war in America was but a portion of the great conflict in which Britain was now engaged against France—the Seven Years' War, 1756-63. The early part of the struggle was decidedly in favour of the French, but, with the appointment of Pitt as colleague of Newcastle and virtual prime-minister in 1758, the face of affairs changed. Reinforcements under Wolfe, Howe, and Amherst were despatched, and after a determined resistance the struggle terminated in the final defeat of the French (1760) and the capitulation of Montreal.

Canada was now formally annexed to the British Empire, and in 1774 an act passed in the British Parliament (the Quebec Act) extended the bounds of the province from Labrador to the Mississippi and from the Ohio to the watershed of Hudson Bay. In 1775 the war of the American Revolution broke out, and Canada became the scene of a brief struggle between the royalists and the revolted colonists of New England. The war ended with the recognition of the independence of the American colonies by the Treaty of Versailles, September 3d, 1783, which detached from Canada the region between the Mississippi and the Ohio. On the other hand, thousands of American loyalists sought new homes in Canada. In 1791 Canada was divided into two provinces—Upper Canada or Ontario, and Lower Canada or Quebec — the latter still retaining its seigneurial tenure and French law in civil cases. In Upper Canada British law and freehold tenure were introduced. In both Upper and Lower Canada representative institutions, although not responsible government, were established. From 1812 to 1815, war having broken out between Great Britain and America, Canada was again the theatre of a bloody strife, amongst the chief incidents of which were Brock's victory over the Americans on the heights of Queenstown, and the battles of Chippewa, Lundy's Lane, Moravian's Town, &c. In 1837–38 the discontent of the people of Canada with their system of irresponsible government took the form of a rebellion, which was repressed after a brief struggle. The Earl of Durham was sent out as governor-general to settle affairs on a just and liberal basis, and made a report on the condition of Canada, which is one of the historical monuments of the country. The result of the rebellion and this report was the reunion in 1841 of Upper and Lower Canada as one province with equal representation in the common legislature, and the practical concession on the part of the mother country of responsible government. Kingston was selected as the new seat of government, and three years afterwards Montreal. In 1854 the Reciprocity Treaty with America was concluded, according to which there was to be free exchange of the products of sea and land, with navigation of the St. Lawrence, &c. In 1858 Ottawa was finally selected as the capital of Canada, the choice having been referred to the queen. Under the old constitution the provinces of Upper and Lower Canada had equal representation in the legislature, but a demand arose on the part of the Upper Canadians for representation by population. This demand was practically conceded in a scheme of federation of the British North-American colonies approved of by the Canadian parliament at Quebec in 1865, and forwarded to the imperial government for approbation. In 1866 the Reciprocity Treaty with the United States having expired, it was not renewed until 1871, when an arrangement for 12 years was signed. In 1866 a Fenian movement against Canada originated in the United States, but the prompt mustering of Canadian volunteers made the filibusters recross the frontier in some haste, to be ultimately disarmed and dispersed by United States troops.

In 1867, March 28th, the British North America act for confederation of the colonies passed the imperial parliament. It united Upper Canada or Ontario, Lower Canada or Quebec, New Brunswick, and Nova Scotia, into one territory, to be named the Dominion of Canada. Newfoundland declared against joining the confederation, but with that exception all the British territory north of the United States was gradually included within the Dominion—the Hudson Bay Company territory by purchase in 1868, British Columbia in 1871, Prince Edward Island in 1873. In 1870 an insurrection of the Red River settlers, who were under apprehensions as to how their titles to their lands might be affected by the cession of the Hudson Bay Company's rights, took place under the leadership of Louis Riel, and had to be suppressed by a military expedition under Colonel (now Viscount) Wolseley. In 1884 the half-breeds and Indians of the Saskatchewan and Assiniboine districts rebelled against the government, but the movement was suppressed in a few months by General Middleton and his volunteer forces, the leader, Louis Riel, being executed at Regina in 1885. On 7th November of the same year the Canadian Pacific Railway (which see) was completed. Since 1888, when the Washington Treaty expired, disputes between the American and Canadian fishermen have been frequent. A joint British and American commission, instituted in 1887, failed to arrive at a final settlement. The seal-fishing in Behring's Sea and the Alaskan boundaries question have also caused friction with the U. States. In 1898 an Anglo-American commission was appointed to adjust all controversial matters between the two countries, but has not been successful in bringing about a final settlement. A contingent of Canadians took part in the South African War (of 1899–1900).

CANADA BALSAM is the name of the resinous substance obtained from the *Abies balsamea* (see SPRUCE). It is found in vesicles underneath the bark, between it and the wood. It is finer than turpentine, and has a pleasant smell, and at first a mild, afterwards a somewhat bitter taste.

CANADIAN PACIFIC RAILWAY, a railway which crosses Canada from the Atlantic to the Pacific. One of the conditions upon which British Columbia entered the Dominion of Canada was the construction of such a railway. Eventually it was completed by a syndicate of capitalists, being opened for general traffic in June, 1886. Commencing at Montreal, the head-quarters, the line goes on to Ottawa, thence northward of the Great Lakes to Port Arthur at the head of Lake Superior, thence to Winnipeg, across the great prairie region, then over the Rocky Mountains (altitude at Stephen 5296 feet), lastly across British Columbia to Vancouver on the Pacific. The length from Montreal to Vancouver is 2906 miles, from Quebec 3078 miles. With side extensions and leased lines the total length of the system is over 9000 miles. Besides their splendid lake steamers the company run a line of mail steamers between Vancouver and China and Japan.

CANAL. A canal, in navigation, is an artificial channel for the transportation of goods or passengers by water. The comparative ease and cheapness with which heavy materials may be conveyed from place to place by water suggested at an early period the formation of canals. Ancient Egypt is represented as intersected by canals branching off from the Nile to distant parts of the country for purposes of irrigation and navigation. The project of the Ptolemies to construct a canal between the Red Sea and the Nile was never completed; it was imagined, owing to the Red Sea having a higher altitude than Egypt, that the country would be submerged. The efforts of ancient Greece in canalization amounted to an attempt to cut the Isthmus of Corinth. The Romans seem to have done scarcely anything in this direction. In China, canals have existed from an early period. The Imperial or Grand Canal, commencing at Hang-tchou, near the mouth of the Tching-tang-chiang River, and crossing the Yang-tse-Kiang, terminates at Lin-ting, on the Eu-ho River, and is about 650 miles in length. It is seldom more than 5 or 6 feet in depth. The Italians were the first people in modern Europe that attempted the construction of canals, but they were principally for the purpose of irrigation. Holland is intersected with numerous canals, the longest stretching from Amsterdam to Nieudiep near the Helder. It is about 50½ miles long, over 20 feet deep, and at the surface of the water 124½ feet wide, narrowing down to 36 feet at bottom. This canal, constructed at a cost of about £1,000,000 sterling, was begun in 1819 and finished in 1825, and affords a safe passage for large vessels between Amsterdam and the German Ocean. It is now of less importance to Amsterdam, however, than the great ship canal from Wijk on the North Sea, completed in 1877. It is 26 feet deep and from 200 to 300 feet wide, and has shortened the distance between Amsterdam and the sea to about 15 miles. In France there are about eighty canals, the principal being that of Languedoc (the Canal du Midi), branching off from the Garonne at Toulouse, and falling into the Mediterranean at Narbonne; the Centre, connecting the Loire with the Saône; the St. Quentin, joining the Scheldt and the Somme; the Besançon Canal, joining the Saône and the Rhone to the Rhine. Germany also has long had important canals, and the Rhine and Danube are so connected. The Russian canal of Nishnei-Volosholk, completed under Peter the Great, but afterwards much improved by Catharine, forms a communication between Astrakhan and St. Petersburg, or in other words, between the Caspian and the Baltic. There are many other canals in Russia supplying the channels of an extensive inland navigation. Goods may be transported by rivers and canals from the frontiers of China to St. Petersburg, a distance of nearly 4500 miles; and there is a continuous navigable communication between the Caspian and the Black Sea in the S., and the Baltic and the Arctic Ocean in the N. Among the Swedish canals are the Tröllhætta and Gotha canals, which, by the help of Lake Wener, Lake Wetter, and other lakes, have opened a communication between the Cattegat and the Baltic. Among the English canals are the Grand Junction, the Leeds and Liverpool, each about 128 miles long; the Trent and Mersey, 93 miles, and the Kennet and Avon, 57 miles long. One of the earliest and most celebrated is the Bridgewater Canal, constructed at the expense of the Duke of Bridgewater, and at first intended to convey coals from his estate at Worsley to Manchester (a distance of 7 miles), but afterwards extended so as to terminate in the Mersey, near Runcorn, with a length of 29 miles. In Scotland there are the Forth and Clyde Canal, 35 miles; the Caledonian (including lakes), 60½ miles; and several others of no great extent. The Caledonian Canal was constructed in order to shorten the passage from the E. coast of Scotland to the W. coast and to the N. of Ireland, and also to enable vessels to avoid the dangerous navigation round the N. coast of Scotland. It runs from the Moray Firth in the E. coast to Loch Eil, an arm of the sea, on the W., passing through Loch Ness, Loch Oich, and Loch Lochy. The canal proper therefore only occupies about 22 miles, but to this may be added over 4 miles of Loch Ness, which had to be deepened by dredging. It has twenty-seven locks, including the tide-locks, one of them 170, but most, if not all the others, 180 feet long, and all 40 feet wide. The canal was constructed under the direction of Thomas Telford, and cost over £1,350,000. Vessels of 500 to 600 tons can pass through it with a full load, and steamers regularly pass through it. The two most important canals in Ireland are the Grand Canal, the total length of which, including its branches, is 164 miles; and the Royal Canal, which is 92 miles long. In America the most extensive undertaking of this kind is the canal connecting the Hudson with Lake Erie. It is 363 miles in length. In Canada there has been constructed, at great expense, the Welland Canal, uniting Lakes Erie and Ontario; the navigation between which by the river was interrupted by the Falls of Niagara. A considerable amount has also been expended upon the Rideau River and Canal, stretching from Kingston on Lake Ontario to Ottawa on the Ottawa River, an affluent of the St. Lawrence.

Of modern canals the grandest and most successful is the Suez Canal, the first of the great ship-canals. Among more recently constructed canals may be mentioned the North Sea and Baltic Canal, the Manchester Canal, and the Isthmus of Corinth Canal. The first named connects the North Sea and Baltic, vessels entering the canal near the mouth of the Elbe and reaching the Baltic near Kiel. The Manchester Canal enables ocean-going steamers to proceed from Runcorn, on the estuary of the Mersey, to the city of Manchester. Of like importance with the Suez Canal is the Panama Canal, also a project of M. de Lesseps. It is designed to connect the Atlantic Ocean with the Pacific by a cutting through the Isthmus of Panama. Its length is calculated at 54 miles, and originally it was not intended to have locks. Whether it will ever be completed remains to be seen. The Nicaragua Canal is a rival enterprise to this, the intention being to cross Central America by a canal which will unite Lake Nicaragua with the San Juan River, and also with the Atlantic and Pacific. A ship canal is being made in Belgium to connect Bruges with Heyst on the North Sea; and Brussels is also to be made a seaport. In Scotland a new canal between the Forth and the Clyde for sea-going vessels has been proposed. See SUEZ CANAL, MANCHESTER CANAL, &c.

CANALETTO.—1. A Venetian painter, born in 1697, whose true name was *Antonio Canale*. He is celebrated for his landscapes, which are true to nature, and his architectural paintings. He died in 1768. He is said to have first used the *camera obscura* for perspective.——2. His nephew, BERNARDO BELOTTI, born in 1724, who was likewise a good artist, and painted at Dresden many Italian landscapes, also goes by this name. He lived in Dresden, where he was a member of the Academy of Painters, and died at Warsaw in 1780.

CANANORE, or CANURA, a seaport town, Hindustan, district Malabar, presidency of Madras, 44 miles N.W. of Calicut. It forms a municipality, and contains various public offices, jail, dispensary, schools, custom-house, &c. There are Anglican, German, and Roman Catholic missions here, and a number of mosques. It has a small trade by sea, but its chief importance is as a military station and the headquarters of the Malabar and Canara force, being garrisoned by one European and one native regiment. The cantonment is spacious and well equipped, on a rocky point jutting out into the sea. There is a fort of triangular area, built by the Dutch and occupied by them till 1766. Pop. (1891), 27,418.

CANA OF GALILEE, a town in Palestine, at no great distance from Capernaum, remarkable chiefly as having been the scene of our Lord's first miracle. It was there he turned water into wine (John ii. 1). It was also the city of Nathanael, and the place where Jesus was applied to by the nobleman from Capernaum on behalf of his dying son, and with a word effected the cure. A long-established tradition has identified it with a village bearing the name of Kefr Kenna, which lies about 4 miles N.E. from Nazareth, but this has been disputed.

CANARA, a maritime region of Hindustan, now partly in the Madras and partly in the Bombay presidency, on the Indian Ocean, and extending along the coast for 180 miles, with a mean breadth of 40 miles. It is covered by the Western Ghauts and their ramifications, but has a number of fertile valleys. The chief exports are rice, sandal-wood, turmeric, oil, and raw silk. The inhabitants belong to many different tribes, but the Jains are most numerous. Canara passed into the hands of the British in 1799, on the death of Tippoo Saib. The Bombay portion has an area of 3911 square miles and a pop. (1891) of 446,351; the Madras portion (S. Canara), 3902 square miles and 1,056,081 inhabitants.

CANARIES, a cluster of islands in the Atlantic, considered as belonging to Africa, the most easterly being about 150 miles from Cape Non. They are thirteen in number, seven of which are considerable, namely Palma, Ferro or Hierro, Gomera, Teneriffe, Grand Canary (Gran Canaria), Fuerteventura, and Lanzarote. The other six are little more than mere rocks. The pop. in 1897 was 334,521, the area being about 2808 square miles. The Canaries form a Spanish province. Lanzarote and Fuerteventura lie in the north-east of the group, Ferro is the farthest south-west. Through Ferro the first meridian used to be drawn. All are rugged and mountainous, frequently presenting deep ravines and precipitous cliffs to the sea, though having also fertile valleys and verdant slopes. The principal peaks are that of Teneriffe, 12,182 feet, and La Cruz, in Palma, 7730 feet. Fuerteventura and Lanzarote, which are nearest the African coast, are less elevated and also less fertile than the others, and have much of an African character. Evidence of volcanic action is almost everywhere present, and volcanic disturbances have taken place on some of the islands in quite modern times. The flora generally resembles that of the Mediterranean region, the trees and shrubs including the oak, chestnut, pine, cedar, laurel, heather, &c.; but there are also plants that belong to the African region, such as the dragon-tree and euphorbias. Among the fauna may be mentioned the canary, the red partridge, and several kinds of lizards; there are no snakes. The goat is the chief domestic animal. The islands are somewhat deficient in moisture and severe droughts sometimes occur; tornadoes also are not infrequent. The climate is hot on the low grounds, temperate higher up, and generally healthy. The soil where suited for cultivation readily produces all kinds of grain, fruits, and vegetables in abundance; so that the name of *Fortunate Islands*, which the ancients gave the Canaries, was well deserved. Some of the islands furnish good wine, especially Teneriffe and Palma. The Canaries constitute a valuable possession to Spain, and they are becoming a common winter resort for invalids from colder regions. This has led to the erection of hotels specially intended for visitors, to the making or improvement of roads, and to the providing of attractions of various kinds, including golf-courses, lawn-tennis grounds, &c. There are several places of worship for English visitors. The exports at present consist chiefly of bananas, tomatoes, and potatoes, shipped in great quantities to London and Liverpool, cochineal, sugar, wine, &c. The imports chiefly consist of textiles and other manufactured goods, cereals, coals, &c. Peaches, oranges, lemons, figs, and other fruits are cultivated. Teneriffe and Grand Canary are the two chief islands. Santa Cruz, the capital of the islands (pop. about 20,000), is a port on the north-east coast of the former, which also contains La Laguna, the old capital, Orotava, and other towns or villages. Orotava is a favourite resort of foreign visitors. Las Palmas, on the north-east coast of Grand Canary, is a more important place, with its new harbour Puerto de la Luz, at the distance of 3½ miles, protected by a breakwater. The city is rapidly extending, its streets have been improved and lighted by electricity, and its popularity as a health-resort is increasing. Numerous steamers engaged in the trade between Europe and Africa call here, and also at Santa Cruz. Though the Canaries were known to the ancients they fell out of the knowledge of Europeans till they again became known from the twelfth or thirteenth century onwards. They were claimed by the Spaniards in the fourteenth century, and in 1402–5 Jean de Bethencourt, a Norman adventurer, conquered Lanzarote, Fuerteventura, Gomera, and Ferro. By the end of the fifteenth century the Spaniards had subdued the original inhabitants entirely; and they almost extirpated them at a later period. These early inhabitants, who are known as Guanches (which see), had attained some progress in civilization, as shown by remains still extant. They were no doubt of Berber stock. The present inhabitants are mainly of Spanish blood, though it is said the Guanche element may still be detected. (See the separate articles on Teneriffe, Grand Canary, Palma, Ferro, and Lanzarote.)

CANARY, GRAND, or GRAN CANARIA, an island in the Atlantic Ocean, about 180 miles from the coast of Africa. Next to Teneriffe it is the largest of the Canary Islands; area, 650 square miles; pop. over 95,000. It is of nearly circular shape, and is a volcanic mountain rising to the height of about 6650 feet. It possesses many natural beauties, but a comparatively small area is under cultivation. Las Palmas is the capital of the island. See CANARIES.

CANARY-BIRD, or CANARY-FINCH. See FINCH.

CANARY ISLANDS. See CANARIES.

CANARY-SEED (*Phalaris canariensis*), the seed of a plant belonging to the order of Graminaceæ, and cultivated for its seed, which is used principally as food for birds. In its early growth it is scarcely distinguishable from oats or wheat. With good cultivation it attains a height of 3 or 4 feet, and terminates in egg-shaped heads or ears, each containing upwards of a hundred seeds. The straw is of little value, either as fodder or litter, but the ears, especially when mixed with other kinds of chaff, are good food for horses. It requires a deep adhesive soil, and its produce per acre is about the same in quantity as wheat. It is a native of the Canary Islands, but is successfully cultivated in England and on the continent of Europe.

CANARY WINE, a wine that comes from the Canary Islands, chiefly from the island of Teneriffe. It is not unlike Madeira.

CANCALE, a seaport of France, in the department of Ille-et-Vilaine, about 8 miles E.N.E. of St. Malo. It is well built, and is pleasantly situated on the Bay of Cancale, which affords good anchorage, and has long been celebrated for its oysters. It is a favourite bathing-place. Pop. (1896), 3579.

CANCER, in astronomy, the fourth sign in the zodiac, marked thus ♋. The sun enters this sign on or about the 21st of June. He is at his greatest northern declination on entering the sign, and the point which he reaches is called the *summer solstice*, because he appears for the moment to stop in his progress northward, and then to turn S. again. The sun is then 23½° N. of the equator, and a small circle of the sphere parallel to the equator at 23½° distant from it is called the *Tropic of Cancer*. The sun leaves this sign about the 22nd of July. The constellation Cancer is no longer in the sign of Cancer. At present it occupies the place of the sign Leo. See also the article ECLIPTIC.

CANCER (derived from the Latin *cancer*, a crab), or CARCINOMA, in medicine and surgery, a name which is given to a group of malignant diseases, in consequence of their supposed resemblance to a crab. They are *heterologous* in their composition, that is, they consist of a growth of substance not like any of the normal tissues, yet they may grow in almost any structure of the body. The cancerous growth is essentially a new product, and it never in any circumstances exists in a healthy system. It possesses vital properties and an organization which are peculiarly its own. Cancer is regarded as to some extent hereditary. It is divided into five varieties, distinguished by the relative proportions of the cells and binding tissue, and of a fluid—the cancer juice—also present in the growth:—

1. *Scirrhus* or *hard cancer*, in which the binding tissue predominates, is a disease only occurring in adult life. It is three times more common in women

than in men. It often attacks the womb, but much more frequently the female breast. It is also of frequent occurrence in the stomach and liver, and when it invades these regions it is invariably fatal in a very short time. When scirrhous cancer attacks the female breast a small lump is at first detected, perhaps as large as a hazel-nut. Slowly but surely it enlarges, and although at first the tumour can be moved about quite freely underneath the skin, as it grows it becomes adherent to the circumjacent tissue, and infiltrates itself through the neighbouring structures. The skin becomes puckered and the nipple retracted, and if the disease is allowed to run its course the skin ulcerates, and an offensive discharge exudes. Soon the glands in the axilla become affected by the disease, and cancer may become deposited in other parts of the body, such as the lungs, liver, kidneys, &c. As the disease advances, the patient's health begins and continues to suffer, and, worn out by acute pain and the profuse discharge, she soon succumbs. This form of cancer kills in about four years. The only cure for this and all kinds of cancer is extirpation by the knife at an early stage of the disease before the neighbouring glands have become affected.

2. *Encephaloid*, *medullary*, or *soft cancer*, in which the cellular structure prevails, is the most malignant variety of the disease. It is met with in many situations where scirrhus is unknown. It may occur at any age, and is often met with in very young children. It may show itself almost anywhere, but its favourite seats are the bones, the viscera, the testicle, the orbit and nasal cavities. It grows very rapidly, often attains an enormous size, and sometimes bleeds freely.

3. *Colloid* or *gum cancer* is a disease of adult life. It is most frequently seen in the intestines, but it may occur in other parts. It is of slow growth.

4. *Melanosis* or *black cancer* is distinguished by the presence of pigment, which is scattered throughout the mass. In other respects it closely resembles the medullary variety. It grows very rapidly, and is soon fatal. It originates in some tissue containing pigment, such as the eye and skin, but soon it invades all tissues alike.

5. *Epithelioma* or *skin cancer*, consisting chiefly of flat cells like those of the skin, or of cells similar to those of glands, is that form of cancer which originates in the skin and mucous membranes. It occurs in the shape of an irregular ulcer, and advances slowly at first. For years it may remain inactive, making little or no progress. Then it may begin to grow more rapidly, and invade the surrounding and neighbouring tissues. The pain, which before was occasional and trifling, now becomes constant and acute. The patient's health begins to suffer. Secondary deposits take place in other parts of the body. Epithelioma most frequently attacks the lips, the anus, the penis, &c., but it is not confined to these situations.

In the treatment of cancer, whatever be its variety, it is necessary to get the disease at an early stage of its growth, so that it may be thoroughly removed with the knife. If it is detected and removed at this period of its existence it is curable, but if the neighbouring glands have become involved in the disease the relief is only temporary. Surgeons now rarely operate when the lymphatic glands have become involved, or in cases where the general health is very low.

CANCER, TROPIC OF. See TROPICS.

CANCER ROOT, or BEECH-DROPS (*Epiphegus virginianus*, L.), a branched parasitic plant, of the order Orobanchaceæ, with brownish scaly leaves, indigenous in America, growing almost exclusively on the exposed root of the beech-tree. The whole plant is powerfully astringent, and the root of a brownish colour, spongy, and of a very nauseous bitter taste. It has been applied more externally than internally to the cure of cancer. Other plants of the same order are also called cancer-root.

CANCRUM ORIS, also called *Water-canker*, a form of gangrene sometimes produced as a result of certain fevers in children. It is accompanied by swelling of the salivary glands and a copious flow of fetid saliva. The gums become ulcerated, the teeth fall out, and dark sores appear on the gums and neighbouring parts of the mouth. As the disease progresses the cheeks, tongue, lips, and chin may be gradually eaten away. Treatment consists simply in maintaining the general health. This disease is fortunately very rare in Britain.

CANDAHAR. See KANDAHAR.

CANDEISH, or KHANDESH, an inland district of British India, in the presidency of Bombay, division of the Deccan, with an area of 10,907 square miles. It has the Satpura Hills and the Nerbudda on the north, Berar on the east, the Ajanta Hills and Nasik on the south, and Baroda on the west. It is very fertile in parts, and has a finely diversified surface, nearly surrounded by mountains, and watered mostly by the Taptee and its tributaries. Wheat, linseed, cotton, &c., are grown, and there is a considerable trade in cotton. Early in the fifteenth century it was governed by independent sovereigns, who had their capital at Asseerghur; it was afterwards subdued and annexed to the Mogul Empire. Under the Mahrattas it possessed many fortresses, strong by nature and art; but suffered so much by misgovernment, famine, and the ravages of predatory hordes, that it had become almost depopulated, and immense tracts, on which luxuriant crops had once grown, were covered with impenetrable jungle. Since 1818, when it was ceded to the British, there has been a great improvement in the state of the country. The chief town is Dhulia (pop. 21,880). Pop. in 1891, 1,460,851.

CANDELABRUM, properly a candlestick, usually denoted a support for a lamp or lamps among the Romans. The candelabra were of considerable size and often intended to stand upon the ground. They were made of wood, bronze, silver, or marble, and were often elaborately and beautifully adorned. Sometimes they had shafts in the shape of columns, which could be shortened or drawn out; sometimes the luxuriant acanthus formed a part of them; sometimes they represented trunks of trees entwined with ivy and flowers, and terminated by vases or bell-flowers at the top, for the reception of the lamps; and not infrequently the lamps were supported by figures. In ancient times Tarentum and Ægina were famous for their elegant candelabra; and Corinth also manufactured them. The Etruscan candelabra of bronze were celebrated.

CANDIA, or CRETE (called in the most ancient times *Idæa*, from Mount Ida, aferwards *Creta*, whence the Turkish name *Kirid*), one of the most important islands of the Turkish Empire, situated in the Mediterranean, 81 miles from the southern extremity of the Morea, and 230 from the African coast, is 160 miles long, 7–35 broad, and contains 3326 square miles. A high chain of mountains, covered with forests, runs through the whole length of the island, in two ranges. On the N. side it declines moderately to a fertile coast, provided with good harbours; on the S. side, steeply to a rocky shore, with few roadsteads, and reaches its greatest height in the lofty Psiloriti (the ancient *Ida*), 8060 feet high, and always covered with snow. Mountain torrents, which are swollen in the winter and spring but almost dry in summer, conduct the waters to the sea. Numerous springs give fertility to most of the valleys, in which, and on the declivities of the mountains, is seen a luxurious vegetation. The air is mild; the summer is cooled by the N. winds; the winter is distinguished only by showers of rain. Earthquakes, however, are not infrequent. The island might, therefore, be a most delightful residence, and supply, as formerly, a much larger population than at present. But agriculture is at a very low stage, while education and the amenities of civilized life are almost entirely absent. The principal products of the island are olive-oil, wheat, oranges, lemons, silk, grapes, wine, valonia, carobs, and honey. The inhabitants (estimated at 1,200,000 in ancient times, or 900,000 in the time of the Venetians) are now about 295,000, of whom about a third are Mohammedans. Soap is extensively manufactured, and the exports comprise olive-oil, soap, wool, carobs, cheese, fruits, valonia, acorns, &c. Most of the harbours are silted up. The capital is Candia, or Megalokastron; Canea is the most important place of trade.

According to Homer, King Idomeneus sailed from this island to Troy, with eighty vessels. The Greek mythology made Crete the scene of many of the adventures of the gods and heroes. Here Saturn is said to have reigned, and afterwards Minos, 1300 years before Christ. The island figures little in Greek history, and took no part in the wars with the Persians. It possessed a number of independent towns often at war with each other, but ready to combine against a stranger. The ancient Cretans had an evil reputation, and in particular were proverbial as liars. Crete was conquered by the Romans in B.C. 67. In the year 823 it passed from the Roman emperors of the East to the Saracens, who built the capital, Candia, on the ruins of Heraclea, but were expelled again, in 961, by the Greeks. The Byzantine sovereign sold the island to the Venetians in 1204, who fortified most of the cities, won the goodwill of their new subjects by a mild government, and repelled all the assaults of the Genoese and Turks till the middle of the seventeenth century. About this time the attacks of the Turks became more determined. They landed a large force in 1645, which soon took Canea and Retimo, and besieged the capital with vigour. The siege, the longest in modern history, lasted over twenty years. To assist the Venetians volunteers from all parts of Europe poured in. The Christians at last, thinned by slaughter and disease, their city in ruins, and its walls battered down, after having exhausted all means of defence, were compelled to surrender to the Turks, Sept. 27, 1669. At the time of the capitulation the garrison consisted of only 2500 soldiers; 30,985 Christians and 118,754 Turks were killed or wounded during the siege. Having obtained possession of the capital, the Turks now endeavoured to expel the Venetians from the strongholds which remained to them on the island, and before the expiration of the seventeenth century they had been successful in their efforts. Three pashas, at Candia, Canea, and Retimo, now governed the island. On account of the feuds of these pashas the inhabitants of the western mountains succeeded in forming a government of their own, under Turkish protection. As the compacts made with them by the Turks were not always observed, they were wont in such cases to take up arms, and though they were often defeated they were never entirely subdued. The pashas having demanded hostages of them in 1821, they joined the Greek insurgents. Had the mountaineers been armed when the Turks made their first descent on the island, it would probably have been impossible for the invaders to have maintained themselves in Candia, but as it was the island remained under Turkish rule. In 1868 a formidable insurrection, fomented by Greece, was with difficulty suppressed by the Turks, after a tedious conflict. In consequence of this revolt the Turks granted to the Cretans a certain degree of autonomy, but Turkish bad faith produced another revolt nine years later. At that time a new constitution of a parliamentary character was inaugurated, but many of its provisions were annulled in 1889. In 1896 there was again a rising against the Turks, in which, as before, the Greeks took part, one result being the outbreak of war between Greece and Turkey. The Greek troops landed on the island were withdrawn at the instance of the great powers, who undertook to secure an autonomous government under Turkish suzerainty and to cause the Turkish troops to be withdrawn. On Sept. 6th, 1898, the Mohammedans of Candia rose against the Christians, and the fighting resulted in the death of many of the latter, including some British sailors. The leading powers at once demanded the complete withdrawal of the Turkish troops who had abetted the rebels, and ultimately, on Oct. 11th, the sultan complied with their demand, the troops being soon after withdrawn. Shortly afterwards Prince George of Greece was appointed high commissioner or governor of the island. There is now a national assembly elected by the people, and the island has received a regular constitution.

CANDIA, or MEGALOKASTRON, capital of the island of Crete or Candia, on the north coast of the island, 65 miles east of Canea. Its harbour admits only vessels of small draught. The governor and the Greek archbishop reside here. Soap is manufactured and exported. The fortifications of the city date from the time of the Venetian occupation, and in 1669, after a prolonged siege, it submitted to the Turks. (See preceding article.) Pop. estimated at 25,000.

CANDIDATE, an applicant for an office, from the Latin *candidatus, white-robed*, because, among the Romans, a man who solicited a public office appeared in a white garment—*toga candida*—and wore this during his candidature, which lasted for two years. In the first year the candidates delivered speeches to the people, or had them delivered by others. After this year they requested the magistrate to enter their names on the list of candidates for the office sought for. Before this was done the previous life of the candidate was subjected to a scrutiny in the senate, after the prætor or consul had received his name. If the senate accepted him he was permitted to offer himself on the day of election as a candidate. The formula by which permission was granted was *rationem habebo, renuntiabo*; if he was not accepted he received the answer *rationem non habebo*; *non renuntiabo*. The tribunes often opposed a candidate who had been accepted by the senate. The morals of the aspirants, in the purer ages of the republic, were always severely examined. In the later period of the republic nobody could obtain an office if he was not present, and if he had not offered himself on three market-days. On these days the candidates tried to insinuate themselves into the favour of the people. They went from house to house (*ambitio*), shook hands with everybody whom they met (*prensatio*), addressed each one by his name, for which purpose they generally had a *nomenclator* with them, who whispered the names of those whom they met into their ear. Cicero, therefore, calls the candidates *natio officiosissima*. They placed themselves on market-days in elevated places in order to be seen. On the day of election they did the same. Favourites of the people accompanied them (*deductores*); some of their suite (*divisores*) distributed money among the people, which, though prohibited, was done publicly. *Inter-*

pretes were employed to bargain with the people, and the money was deposited in the hands of *sequestres*. Sometimes a number of candidates united into parties (*coitiones*), in order to defeat the endeavours of the others. At last the grounds on which each candidate rested his claims to the office were read, and the *tribes* delivered their votes. The successful candidate then sacrificed to the gods in the capitol. To oppose a candidate was called *ei refragari;* to support him, *suffragari*, or *suffragatores esse*. We have dwelt so long on this subject on account of the similarity between the ancient and the modern modes of seeking office. The word *candidate* is also used by Protestants to designate a theologian who, having finished his studies at a university, is waiting for an appointment in the church.

CANDIDE, the name of a famous tale of Voltaire's, forming an epoch in French literature, in which he ridicules the system of optimism with his usual spirit, and attacks revelation with plausible but superficial arguments. Voltaire is unsurpassed in the art of treating the most serious subjects with light raillery, while he seduces the reader by the charms of his style. Some descriptions in this tale, for instance, that of the carnival at Venice, are excellent.

CANDLE, a solid cylindrical rod, composed of some fatty substance, with a small bundle of loosely twisted threads placed longitudinally in its centre, and intended to burn slowly as a domestic light during the absence of the sun. At one time the lamp, fed by some combustible liquid, was the only light which competed with the candle; but coal-gas has long been a much more formidable competitor (not to mention the electric light recently introduced), and in towns has entirely superseded the use of the candle both in shops and dwelling-houses. Still, however, the portability of the candle makes it occasionally necessary, even where gas or other light is used; while its freedom from smell, and its non-liability to cause dangerous accidents, maintain it still in common use. Hence candle-making still forms a somewhat important branch of manufacture in many places. The chief material used for making candles is tallow, either alone, in a pure state, or in mixture with other fatty substances, as palm-oil, spermaceti, wax, &c. Paraffin candles are now made in considerable quantities also. The quantity of tallow furnished by the home supply in Britain falls far short of the demand for various purposes, and is largely supplemented by importation, 100,000 tons of tallow and stearine being imported in 1895, the chief supplies coming from Australia, the United States, the Argentine Republic, Uruguay, France, Russia, &c. Palm-oil, of which above 40,000 tons are annually imported, is obtained from the western coast of Africa, especially about Lagos. The palm which yields it is the *Elais Guineensis*, which produces a golden-yellow fruit, of the size and shape of a pigeon's egg. By detaching its pulp from the kernel, bruising it into a paste, and then agitating it in boiling water, the oil is separated, and rising to the surface, concretes as the water cools. About two-thirds of it in weight consists of a peculiar white solid fat, called *palmitine;* the remainder is chiefly *oleine*. Ordinary tallow candles are either *dipped* or *moulded*. The former, generally composed of the coarser tallow, are made by attaching a number of separate wicks, of the proper length and thickness, to a frame, and dipping the whole into a cistern of melted tallow as often as may be necessary to give the candle the required thickness, always allowing as much time to elapse between the successive dippings as may be necessary to consolidate the tallow taken up by each. Moulded candles, as their name implies, are formed in moulds. These, made generally of pewter, though glass has also been introduced, are hollow cylinders of the length of the candle, and open at both ends, but provided at the upper end with a conical cap, in which there is a hole for the wick. A number of these moulds are inserted in a wooden frame or trough with their heads downwards; the wick is then drawn in through the top hole by means of a wire, and kept stretched and in the centre by a peculiar arrangement. The moulds thus prepared are filled by running melted tallow of the proper temperature from a boiler into the trough. The candles remain in the moulds for about twenty-four hours, but, as they improve by keeping, generally remain in the storehouse for a few months before they are exposed for sale. Considerable modern improvements have been made in the manufacture of candles. One of the most important of these consists in not employing the whole of the fatty or oily substances, but in decomposing them, and then using only the *stearine* of the former, and the *palmitine* of the latter class of substances. The chief chemical agents employed to obtain the stearine are caustic lime, which, setting free the *glycerine*, produces stearate, margarate, and oleate of lime, in the form of a solid soap; and dilute sulphuric acid, by which this solid soap, after being reduced to powder, is effectually freed of its lime. By means of a subsequent bleaching process cakes of a perfectly white colour, free from impurities, and fit for the manufacture of candles, are obtained. By similar processes bleached solid fat of palm-oil is procured, and used in several establishments on a very extensive scale. Wax, from its tenacity, and the contraction which it undergoes in cooling, cannot be formed into candles by melting it, and then running it into moulds, and therefore requires a different process. It is briefly as follows:—Wicks, properly cut and twisted, are suspended by a ring over a basin of liquid wax, which is poured on the tops of the wicks, and gradually adhering, covers them. When a sufficient thickness is obtained, the candles, while hot, are placed on a smooth walnut table, kept constantly wet, and rolled upon it by means of a flat piece of boxwood. In this way they assume a perfectly cylindrical form. The large wax candles used in Roman Catholic churches are merely plates of wax bent round a wick and then rolled. The long thin coiled wax tapers are made somewhat in the same way as wire is drawn. A wick, wound continuously round a drum, is made to pass through a pan of fluid wax, then drawn through holes of the proper size, when it is unwound from the one drum, and wound, in a waxed state, upon another drum. Rushlights, once very extensively used, were so named from having wicks made of the common soft rush (*Juncus effusus*). The process is described at length, and some interesting calculations made with regard to it, by the Rev. Gilbert White, in his well-known History of Selborne.

CANDLEBERRY, CANDLEBERRY MYRTLE, WAX MYRTLE, TALLOW TREE, &c. (*Myrica cerifera*), a shrub common in North America, where candles are made from the waxy substance collected from a decoction of the fruit or berry. It grows abundantly in a wet soil, and seems to thrive particularly well in the neighbourhood of the sea, nor does it ever seem to be found high up in the country. The berries intended for making candles are gathered late in autumn and are thrown into a pot of boiling water, where the fatty or waxy substance floats on the top and is skimmed off. When congealed this substance is of a dirty green colour, somewhat intermediate in its nature between wax and tallow. After being again melted and refined, it assumes a transparent green hue. Mixed with a proportion of tallow it forms candles, which burn better and slower than common tallow ones, and do not run so much in hot weather. They have also very little smoke, and emit a rather agreeable odour. A soap and also a sealing-wax is also made up of this substance. The plant has been cultivated in France and Germany, where it grows in the open air. Another plant belonging to the same genus is the sweet gale (*Myrica gale*), which grows abundantly in bogs and marshes in Scotland. It is a small shrub with leaves somewhat like the myrtle or willow, of a fragrant odour and bitter taste, and yielding an essential oil by distillation. It was formerly used in the N. of Europe instead of hops, and in some places it is still so used. The catkins or cones boiled in water throw up a scum resembling bees'-wax, which collected in sufficient quantities would make candles. The plant is used to tan calf-skins. Gathered in the autumn, it dyes wool a yellow colour, and is thus used both in Sweden and in Wales. The dried leaves are used to scent linen and other clothes. Horses and goats eat the plant, while sheep and cows refuse it.

CANDLEMAS, an ecclesiastical festival, instituted by Pope Gelasius I. in 492, in commemoration of the presentation of Christ in the temple, and of the purification of the Virgin Mary. It is celebrated on February 2, and has its name from the fact that candles were, and in the Roman Church still are, blessed and carried in procession, in allusion to the words of Simeon, 'a light to lighten the Gentiles'. In Scotland it is one of the four term days. See PURIFICATION.

CANDOLLE, DE. See DE CANDOLLE.

CANDY, or KANDY, one of the chief towns in Ceylon, is situated near the centre of the island (Central Province), 72 miles N.E. Colombo, in a fertile valley surrounded by finely wooded hills, at the height of about 2000 feet. 'Kandy is uniquely beautiful—the most charming little town in the world, travellers usually describe it. It is situated in a valley surrounded by hills, and boasts an artificial lake, Buddhist and Hindu temples, including the Maligáwa, the most sacred Buddhist temple in the world. This contains the so-called relic of Buddha's tooth, . . . which is had in reverence in portions of India, Thibet, and even China and Japan.' It mainly consists of three principal streets, two running E. and W., crossed by the third running N. and S. The houses, public buildings, &c., are substantially built, and 'the Pavilion', or official residence of the governor, is one of the finest structures in Ceylon. Candy is connected by railway with Colombo, the railway running through some beautiful scenery. The botanic gardens at Peradeniya, 8 miles from Kandy, are beautiful, and beautifully situated; and there are many interesting localities in the neighbourhood. Kandy was the capital of the ancient kings of Ceylon. Pop. (1891), 20,252.

CANE See BAMBOO and RATTAN.

CANE, SUGAR. See SUGAR-CANE.

CANEA, or KHANIA, a seaport and the principal commercial town in the island of Crete or Candia, on the N. coast of the island, on the E. side of the Gulf of Canea. It consists mostly of narrow streets, has a fort, a lighthouse, mosques, Greek churches, &c. The harbour admits vessels of considerable size, and the chief exports are wax, soap, silk, fruits, wool. Canea is believed to stand on the site of the ancient Cydonia. Pop. estimated at 13,000 to 19,000.

CANELLA, WHITE (*C. alba*), a tree belonging to the W. Indies, growing to the height of 10 to 50 feet, with a straight stem branched only at the top. It is covered with a whitish bark, by which it is easily distinguished at a distance from other trees; the leaves are placed upon short foot-stalks, and stand alternately. They are oblong, obtuse, entire, of a dark shining green hue, and thick like those of the laurel. The flowers are small, seldom opening, of a violet colour, and grow in clusters at the tops of the branches on divided foot-stalks. The fruit is an oblong berry containing four kidney-shaped seeds of an equal size. The whole tree is very aromatic, and when in blossom perfumes the whole neighbourhood. The berries when ripe are greedily eaten by the wild pigeons of Jamaica, and impart a peculiar flavour to their flesh. The canella of commerce is the bark of the tree freed from its outward covering and dried in the shade. It is brought to Europe in long quills, which are about ¾ inch in diameter, somewhat thicker than cinnamon, and both externally and internally of a whitish or light-brown hue, with a tinge of yellow. This bark is moderately warm to the taste, and aromatic and bitterish. Its smell is agreeable, and resembles that of cloves. In distillation with water it yields an essential oil of a dark yellowish colour, and of a thick tenacious consistence, with difficulty separable from the aqueous fluid. The remaining decoction when evaporated leaves a very bitter extract composed of resinous and gummy matter imperfectly mixed. It has been supposed to possess a considerable share of active medicinal powers, and was formerly employed as a cure in scurvy. Now it is merely esteemed as a pleasing and aromatic bitter, and as a useful adjunct in correcting more active, though nauseous medicines. The powder is given along with aloes as a stimulating purgative.

CANES VENATICI (*the hunting dogs*), a northern constellation, within the limits of which several remarkable nebulæ occur.

CANGE, DU. See DU FRESNE.

CANICATTI, a town in Sicily, province of Girgenti, is well built, and has a pop. (town and commune) of 20,908, mostly engaged in agriculture.

CANINO, PRINCE OF. See BONAPARTE (LUCIEN).

CANIS, a genus of carnivorous Mammalia, of which the common dog is regarded as the type, but under which Cuvier also includes wolves and jackals. He has thus, however, confined it within narrower limits than Linnæus, who made it include hyænas and foxes. The chief characteristics of the genus are six upper front teeth, the lateral longest and the intermediate lobated; six lower front teeth, the lateral lobated; canine teeth, single and incurvated; and grinders, six or seven in number. The hyænas are excluded from the genus by their dentition, prickly tongue, mane, and largely developed anal scent glands; and the foxes by their longer and more bushy tail, and the pupils of the eye, which by day present a kind of longitudinal slit instead of the round form.

CANISIUS, PETRUS, born at Nimeguen, was the first man in Germany who entered the order of the Jesuits, of which he became a very active member. In 1549 he was made professor of theology, rector and vice-chancellor of the university at Ingolstadt. He afterwards reformed the University of Vienna according to the views of the order. His catechism is yet in use. He persuaded Ferdinand I. to adopt violent measures against the Protestants, and founded the colleges at Prague, Augsburg, Dillingen, and Freiburg in Switzerland, in the latter of which he died in 1597.

CANIS MAJOR (*the greater dog*), a constellation of the southern hemisphere, remarkable as containing *Sirius*, the brightest star in the heavens.—CANIS MINOR (*the lesser dog*), a constellation in the southern hemisphere, near Canis Major, the chief star in which is *Procyon*, a star of the first magnitude.

CANISTER-SHOT. See CASE-SHOT.

CANKER, a term applied to almost every case in which a portion of a vegetable loses its vitality from some latent disease, which ultimately destroys the parent stock. Thus we hear of canker in auriculas, melons, cucumbers, &c.; forest, apple, and pear trees, &c. The causes of the malady are probably various, and have not yet been satisfactorily explained. In many cases it is clearly hereditary, and does not admit of being either entirely prevented or greatly modified; but when it is only constitutional it is greatly mitigated by careful cultivation, and the selection of the most favourable circumstances of soil, drainage, and temperature. In laying out gardens or orchards the great point is to ascertain what sorts are least liable to be affected by the disease in any particular district, and to make the selection accordingly.—Canker in the foot of horses is a disease believed to be of cancerous nature. It is of two kinds—acute and local, and chronic and constitutional. It is most frequent among underfed, overworked, or badly-stabled horses. The application of active caustics in severe cases, together with good food, dry warm stabling, fresh air and exercise, with periodical purgatives and alteratives, may be said to be the best method of treatment.

CANNÆ, a town of ancient Italy, the site of which was between the modern Canosa and Barletta, prov. Bari, famous for the great battle in which the Romans were defeated by Hannibal (216 B.C.). The Roman army under the Consuls Æmilius Paulus and Terentius Varro consisted of 87,000 men, while that of the enemy amounted only to 50,000, among whom were 10,000 horse. The battle was brought on by the Consul Varro against the better judgment of his colleague. The Romans left their strong position at Canusium on the banks of the Aufidus, and the whole army crossed the river. The Consul Varro drew up his troops on the plain, with his right wing protected by the river. At the same time Hannibal forded the Aufidus and led his small army to the attack. The Romans had their own cavalry on the right wing, that of their allies on the left, and the infantry as usual in the centre. Hannibal opposed the Numidian cavalry to that of the Roman allies, and that of the Spaniards and Gauls to the Roman. His infantry from Africa he divided into two bodies, each of them near the cavalry. At some distance from both wings the Spaniards and Gauls on foot, arranged in an obtuse angle, occupied the centre, led by Hannibal himself. He had calculated that the wind called *Volturnus*, which blew regularly at certain hours, would, at the time of attack, throw dust and sand in the eyes of the Romans and hide his evolutions. The first shock of the Roman cavalry upon the Spaniards and Gauls was violent. After the fight had lasted for a long time they alighted and fought on foot. The Gauls and Spaniards then broke through the dismounted Romans and cut them down. The Roman infantry, to assist their horse, moved in a curved line towards the wing under very disadvantageous circumstances, and attacked the Spanish and Gallic infantry, which retired in good order into the intervals as Hannibal had commanded. By this means Hannibal was enabled to attack the Romans in flank as they advanced incautiously with the African infantry, which he had kept back for this purpose. Thus surrounded and contracted into a small compass, the Romans fell in great numbers, among them the Consul Æmilius Paulus, and both the proconsuls Servilius and Atilius. The Numidian horse destroyed those who fled from the field of battle. The victor made 13,000 prisoners. The Romans lost, according to their own lowest statements, 45,000 men; according to the highest, 70,000. Hannibal collected the gold rings of the knights who had fallen and sent some pecks thereof to Carthage. See HANNIBAL.

CANNEL COAL. See COAL.

CANNES, a seaport and health resort of France, on the shore of the Mediterranean, in the department of Alpes-Maritimes. It is beautifully situated, has a mild and equable climate, and thus attracts numerous winter visitors. There are many hotels and fine villas, charming public walks, &c. Perfumes and soap are made. Pop. (1891), 15,140.

CANNIBALS. See ANTHROPOPHAGI.

CANNING, GEORGE, a distinguished orator and statesman, was born in London, April 11, 1770. His father offended his family by marrying a lady of beauty and accomplishments, but without fortune, and died in 1771, leaving her destitute. She had recourse to the stage for support, but was not very successful, and was afterwards twice married. Her second husband was an actor; her third a linen-draper of Exeter. She lived to see the success of her son, from whom she ever received the tenderest marks of filial love. Canning, who had inherited a small estate in Ireland, was educated at Eton. In 1787 he was entered at Oxford. His vacations were passed with Sheridan, by whom he was introduced to Burke, Fox, and other distinguished Whigs. But although Sheridan had already announced him in Parliament as the future ornament of his party, Canning entered into terms with Pitt, by whom he was brought into Parliament in 1793. During the first session he remained silent. In 1796 he was under-secretary of state. In 1797 he projected, with some friends, the Anti-Jacobin, of which Gifford was appointed editor. Canning contributed many poetical and other articles to this periodical, the happiest of his efforts in this direction being the Needy Knife-grinder. In 1798 he supported Wilberforce's motion for the abolition of the slave-trade. In July, 1800, Canning increased his fortune and influence by a marriage with Joanna, daughter of General Scott, a lady with a fortune of £100,000. The administration being dissolved in 1801, Canning became a member of the opposition until the restoration of Pitt in 1804. In 1807 he was appointed secretary of state for foreign affairs, in the Portland administration. A political misunderstanding with Lord Castlereagh led to a duel between that minister and Canning, in which the latter was slightly wounded. This dispute occasioned the dissolution of the ministry. In 1810 he opposed the reference of the Catholic claims to the committee of the whole House, on the ground that no security or engagement had been offered by the Catholics. Some of his most brilliant speeches were on this subject. The adoption of the measure being a matter of policy, the state of opinion, the condition of affairs, and the securities with which it should be accompanied, were with him elements of the question. He proposed securities in 1813, which, with the bill, were rejected. He supported in 1812 and 1813 the same motion which he had opposed in 1810. To Canning was principally owing the first blow which shook the throne of Napoleon: the British policy in Spain was directed and animated by him. In 1812 he was elected member for Liverpool, from which he was also returned in 1814, 1818, 1820. In 1814 he was appointed minister to Portugal, and remained abroad about two years. In 1819 he declared his decided hostility to parliamentary reform in whatever shape. On the occasion of the proceedings relative to the queen, he declared that 'toward the object of that investigation he felt an unaltered regard and affection;' and soon after resigned the presidency of the board of control, and went abroad. Having been nominated Governor-general of India, he was on the point of embarking when the death of the Marquis of Londonderry called him to the cabinet as secretary for foreign affairs (Sept. 16, 1822). One of his earliest acts in this situation was to check the French influence in Spain, the French having sent an army into that country to put down the revolutionary party. By way of withdrawing the Spanish American colonies from French influence he decided to recognize their independence; thus, as he afterwards phrased it, 'calling the New World into existence to redress the balance of the Old'. He continued to support the propositions in favour of the Catholics, and in 1825 communicated to foreign ministers the determination of the government to appoint *chargés d'affaires* to Colombia, Mexico, and Buenos Ayres. In consequence of the attempts made by Spain to assist the malcontents of Portugal, it was immediately determined by the ministry to support the regency of that country, and troops were sent to Lisbon in Jan. 1827. On April 12, 1827, his appointment to be prime minister was announced. His administration was terminated by his death, on the 8th of August following, but not until it had been crowned by the Treaty of London (July 6), for the settlement of the affairs of Greece. As an orator Mr. Canning was showy and graceful, with a brilliant wit and caustic satire, though neither formed on a very masculine taste. During his career the leading domestic subjects on which the British Parliament was called upon to legislate were the following: the liberty of the press, the emancipation of the Catholics, the test and corporation acts, the corn-laws, and reform in Parliament. Those of a foreign nature were, among others, the various overtures of peace between Britain and France, the settlement of Europe on the overthrow of Napoleon, the treatment of Italy by the Austrians, the Spanish revolution, and recognition of the South American republics. On all these questions, with one or two exceptions, he supported the high Tory side. The chief exceptions were the emancipation of the Catholics, and the recognition of the South American republics. He was also desirous of amending the corn-laws. What he might have effected in the position of premier must be matter of speculation, since death speedily interfered with any expectations that were formed of him in that position. See Stapleton's Political Life of Canning (1831), and his Canning and his Time (1835).

CANNING, STRATFORD, VISCOUNT STRATFORD DE REDCLIFFE, diplomatist, cousin of George Canning, was born on Nov. 4, 1786, in London. His father, Stratford Canning, who had been disinherited owing to an imprudent marriage, and had gone into business as a merchant, died a few months after his son's birth, and in consequence young Stratford and his mother removed to Wanstead. After attending two elementary schools he went to Eton, and in 1805 he was elected to a scholarship at King's College, Cambridge. Before graduating he was in 1807 appointed by his great cousin, then foreign secretary, to be his précis writer, and in the latter part of that year he was sent as second secretary with a mission to Denmark. In the following year he accompanied as first secretary an important mission to Constantinople, which resulted in the conclusion of a treaty of peace with the Porte on Jan. 5, 1809. In the summer of 1810 his chief, Sir Robert Adair, was transferred to Vienna, and Canning temporarily succeeded him as ambassador at Constantinople. Before the arrival of Adair's successor, Canning made his reputation as a diplomatist by the masterly way in which he conducted the difficult negotiations which led to the signing of the treaty of Bucharest on May 28, 1812. This treaty put an end for the time to the war between Russia and Turkey, and thus left Russia free to resist the advance of Napoleon. Moreover, it firmly secured English predominance at Constantinople, and was in this respect the first notable triumph in the traditional British policy on the Eastern Question. In 1812 Canning returned to London, and after declining in 1813 the offer of the chief secretaryship to Lord Aberdeen's Vienna mission, he accepted in the following year the post of envoy extraordinary and minister plenipotentiary in Switzerland. He held this post till 1818, and was completely successful in his endeavours to free Switzerland from French domination, and to erect it into a neutral federal republic. In 1816 he had married, but his wife died two years afterwards near Lausanne, and it was chiefly on this account that he applied for and obtained his recall. Shortly after his return he was appointed ambassador to the United States, and he arrived at Washington in the autumn of 1820. He was again in London in 1823. The diplomatic agreement arrived at in 1824 was however, thrown out by the United States Senate. After a brief but important mission to the Russian capital he was again sent to Constantinople in October 1825 as ambassador. In the following year he succeeded in again patching up a peace between Russia and Turkey, and thus prepared the way for a joint representation by England, France, and Russia on behalf of insurgent Greece. Negotiations were, however, abruptly broken off by the sultan's indignation on learning of the battle of Navarino, and Canning, in 1828, went to London. On his return to the East in the same year he was engaged along with the representatives of France and Russia in drawing up proposals for establishing a Greek kingdom. These proposals were ultimately forced on the acceptance of Turkey in a more stringent form as part of the peace treaty which ended the Russo-Turkish war of 1828–29. In 1829 he resigned his position and returned to England, where he was created G.C.B. He entered Parliament as member for Old Sarum, but he ultimately secured election for King's Lynn. After acting as special envoy to the Porte in 1831–32, and to Portugal in 1832–33, he was in 1841 appointed for the third time ambassador at Constantinople. For a considerable period he was mainly engaged in assisting and encouraging the sultan, Abd-el-Mejid, in his policy of reform, but after a visit to England in 1852, during which he was raised to the peerage, his efforts had to be directed to thwarting Russian designs. His diplomatic triumph over Prince Mentchikoff caused the Czar in a moment of irritation to precipitate the Crimean war. His reign at Constantinople ended with his resignation in 1858, in which year he returned to England. The remainder of his career was passed mainly in retirement, and he died on Aug. 14, 1880. In addition to a few volumes of poetry, he published works entitled Why am I a Christian? (1873) and The Greatest of Miracles (1876). A selection of his articles on eastern affairs was published in 1881 under the title of The Eastern Question. See the Life by Stanley Lane-Poole (2 vols., 1888).

CANNOCK, a town of England, in West Staffordshire, 7½ miles N.W. of Walsall, in the district known as Cannock Chase, which is rich in coal and ironstone. Manufactures of boilers, edge-tools, bricks and tiles, are carried on, and there are numerous collieries. Pop. (1891), 20,613; (1901), 23,992.

CANNON, a large sort of gun or firearm used for throwing heavy projectiles such as balls or shells by means of gunpowder; a piece of ordnance or artillery. It is impossible to say definitely where and when cannons were first used in war, but there are several instances of their use in the fourteenth century, notably by the English at Cressy (1346), and in the fifteenth century they were employed by all the leading nations of Europe. The earliest forms were made of iron bars joined along their length, and strengthened by hoops of the same metal, and the early projectiles were often of stone. An interesting specimen of the older cannons is that known as Mons Meg, constructed in 1486, and now in Edinburgh Castle. From about 1450 cannon were cast in iron and other metals, and stone projectiles also gave way to metal balls, and in some measure to shells. Shell-mortars were made in Germany in the later sixteenth century, and about a century later the somewhat similar howitzer was introduced. The carronade was another form of short, wide cannon, which was first made at the end of the eighteenth century. The most important modern development in long guns is the introduction of rifling, a principle first applied to cannon in 1846 by the Sardinian Cavalli and the Swedish Wahrendorf. Rifled ordnance has now practically displaced the older smoothbore cannon, and it is partly for this reason, and partly because of the improvements in the manufacture of gunpowder and projectiles, and the extensive use of steel in their construction, that modern cannon are such accurate and deadly engines of warfare. See GUN for a description of modern forms of cannon.

CANNSTADT, CANNSTATT, or KANSTATT, a town in Würtemberg, in a beautiful and fertile district on the Neckar, 2 miles north-east of Stuttgart. Its antiquity is proved by the Roman remains found. It has celebrated and much-frequented mineral springs, active and varied industries, including railway workshops, cotton-spinning, dyeing, &c., and forms an important entrepôt for the traffic of the Neckar, which is here crossed by two bridges. Pop. (1895), 22,590.

CANO, ALONSO, a Spanish painter, sculptor, and architect. The variety and extent of his talents made him the Michael Angelo of Spain, whom he also resembled in his private character. He was born in 1601, at Granada, studied in Seville, with Pacheco, and first made himself known by the statues which he executed for the great church of Lebrija. In his twenty-fourth year he had acquired the fame of a great artist, and in 1638 he was appointed painter to the king. In this capacity he executed several celebrated pictures, and was at the summit of his prosperity when a dreadful event destroyed his happiness. His wife was one day found murdered, and his house plundered. Instead of a suspected Italian servant, who had fled, Cano himself, convicted of a connection with another woman, was accused of the murder, and was put to the torture; but as he confessed nothing he was regarded as innocent, and regained the favour of the king. He latterly joined a religious order, but still practised his art, and died in 1667.

CANOBUS. See CANOPUS.

CANOE, the term generally used to designate the small vessels which uncivilized people living near the water use, and which are propelled by paddles not oars. The name is of West Indian origin. The North American Indians generally impel their canoes with paddles which have a very large blade, and are managed perpendicularly. The canoes of Canada are of the most fragile texture, and of so little weight that, in passing from one river to another the boatmen carry them on their heads across the portages. They are mostly covered with bark, the pieces of which are sewed together with a kind of grass. This bark is generally not more than a quarter of an inch in thickness; yet in these frail vessels the Indians and Canadians do not hesitate to descend very dangerous rapids. The Esquimaux are exceedingly dexterous in the management of their canoes. These consist of a light wooden frame, covered with seal-skins sewed together with sinews. The skins are not only extended round the bottom and sides, but likewise over the top, forming a complete deck, and having only one opening to admit the boatman to his seat. To this hole a flat hoop, rising about 4 inches, is fitted, to which is fastened the surrounding skin. The paddle is about 10 feet long, light, and flat at each end. In the Esquimaux language the canoe is called a *kaiak*, or man's boat, to distinguish it from the *umiak*, the woman's boat, which latter is a large boat for transporting the women, with their families and possessions. In the islands of the South Sea the natives have many double canoes, united by a strong platform, serving in this way as one vessel. Such a canoe is capable of carrying a number of persons, and a considerable lading. Of canoes used for purposes of recreation, as is common at the present day, there are three leading types. These are: (1) the *open, undecked*, or *Canadian* canoe, propelled solely by paddling; (2) the *Rob Roy* type, introduced about 1866 by the founder of modern canoeing, Mr. John Macgregor, always clincher-built (unlike the Canadian), decked, made of oak or cedar, about 14 feet by 2, mainly paddled, but adapted for a small sail also, and intended for only one or two persons; and (3) the *Nautilus* type, introduced about 1870 by Mr. W. Baden-Powell, a larger form of the previous type, better adapted for carrying sails, and improved in various ways, generally but not invariably clincher-built. The opening in the centre of a decked canoe for admitting cargo and crew is called the *well* or *cock-pit*. The flat part of the paddle is called the *blade* or *palm*, and the shaft the *round*. Paddles are usually about 8 feet long, and about 6 inches broad in the palm, and are generally made of pine or spruce. Canoe-racing in Britain is chiefly carried on by the Royal Canoe Club, whose head-quarters are at Kingston-on-Thames. It divides canoes for this purpose into three classes, namely, the canoe yawl, the cruising canoe, and the sailing canoe adapted for racing. The first is the largest form. Her beam must be not less than 3 feet, and her rating must not exceed ·5. She must, like both the other kinds, be sharp at each end, with no transom or flat stern, and she must be fitted with two fixed transverse bulkheads, not more than 10 nor less than 6 feet apart. The last-named variety differs from the yawl chiefly in being smaller. A cruising canoe must not exceed 16 feet in length, or 3 feet 6 inches in the beam, and her fixed draught, including keel (which must be detachable), must not be above 14 inches. Her rating must not exceed ·3. Paper and canvas canoes are in use, the former chiefly in America. For further information on canoes and canoeing the reader is referred to the article by W. Baden-Powell in the Encyclopædia of Sport (1897), from which much of the above information has been derived, and to the following works: Yachts, Boats, and Canoes, by C. S. Hicks (1887); Canoe Travelling, by W. B. Powell (1871); the works of J. Macgregor (Rob Roy); Canoeing with Sail and Paddle, by J. D. Hayward (1893); Canvas Canoes, by P. B. Field (1887); &c.

CANON, a person who possesses a prebend, or revenue allotted for the performance of divine service in a cathedral or collegiate church. In England there are what are called canons residentiary (appointed by the Crown), honorary canons, and minor canons.

CANON (Greek, a *rule, measure*, or *standard*), in the arts. When art has succeeded in producing beautiful forms the question arises, with what proportions beauty of form is united. Artists of genius first started this question, and imitators, inferior to them in talents, scrupulously followed their results, and naturally exalted some existing work into a model for every performance. Among the Greeks the celebrated statuary Polycletus (B.C. 452–12) first instituted such inquiries; and as he generally represented youthful, pleasing figures it is probable that he fixed the standard of beauty in the youthful form. The *canon* (the model statue) of Polycletus was accordingly a statue which was made principally for the purpose of showing the beautiful proportions of the human form in a youth just ripening into manhood. No copy of it is known to exist; the artist probably gave his model of proportion a quiet, simple attitude, without any strong distinguishing marks. His successors imitated it without deviation. Polycletus was not the only Greek artist who pursued such investigations respecting the proportions of form. Among the moderns, Dürer and Leonardo da Vinci have devoted themselves to similar inquiries.

CANON, in music, signified, with the ancient Greeks, what now is called *monochord*. At present it signifies a composition in which the several voices begin at fixed intervals, one after the other, and in which each successive voice sings the strain of the preceding one. In Italian, therefore, it is called *fuga di conseguenza;* in Latin, *canon perpetuus*, or continuous fugue; in German, *Kreisfuge* (circulating fugue). Sometimes each voice begins with the same, sometimes with different notes. The phrase or passage for imitation is called the *theme* or *subject*, the imitation the *reply*. Canons may be finite or infinite. The former end, like any other compositions, with a cadence, while the infinite canon is so contrived that the theme is begun again before the parts which follow are concluded. A canon may consist of two, three, four, or more voices. Canons differ from ordinary fugues; for, in the latter, it is sufficient that the subject be occasionally repeated and imitated according to the laws of counterpoint; but, in the former, it is essential that the subject be strictly repeated by all the succeeding parts; which repetition may be made in the unison or octave, the fourth, or the fifth, or any other interval of the scale. There are several other canons, as *canon polymorphus*, *canon per diminutionem*, and *canon per augmentationem*, which to explain would exceed our limits. Sometimes, also, a musical passage of a composition in which one voice repeats for a short time another, is called improperly a canon.

CANON, a term employed to designate the collection of books containing the rule or standard of primitive Christianity; that is, the canonical books of the Holy Scriptures, whose divine origin the church acknowledges. The canon of the books of the Old Testament, as contained in the Hebrew Bible, receives in this form equal respect among all Christians, because Christ and the apostles have expressly appealed to them, and in this way pronounced them writings inspired by God. There are certain books, however, belonging in subject to the Old Testament, but whose canonical character the Jews did not acknowledge, and which Protestants class together under the head of Apocrypha, and reject from the canon. For these there is only a Greek, and not a Hebrew text. The Western Church accepted them as canonical in the African Council, about the end of the fourth century; but the opinions of the clergy respecting them remained for a long time divided. St. Jerome denied their canonicity, and many theologians coincided with him. The Roman Church finally declared them canonical in the Council of Trent. (See APOCRYPHA.) Respecting the number of the books belonging to the canon of the New Testament, the opinions of Christians were much divided till the sixth century. As early as the second century the separation was made into the Evangelicon (the four Evangelists) and the Apostolicon (the Acts and Epistles of the Apostles). The five historical books, the Epistles of Paul, the First Epistle of Peter, and the First Epistle of John were universally acknowledged to be genuine in the third century; hence Eusebius, in his Ecclesiastical History, written about A.D. 325, calls them *Homologoumena* (universally received). The other five catholic epistles (Second of Peter, Second and Third of John, Jude, and James) he calls *Antilegomena* (doubtful, not universally received). At that time the Epistle to the Hebrews was considered genuine by most persons, and the Apocalypse by many. These books were received in the second half of the fourth century in the Egyptian Church (where Athanasius first used the term *canonical*), and in the Western Church. In the Eastern Church, properly so called (the dioceses of the patriarchs of Constantinople, Antioch, and Jerusalem), only the catholic epistles were of canonical authority at that time; the Apocalypse not till the sixth century. The canon of the New Testament has since remained unaltered, and the Protestant churches hold it in common with the Greek and Roman churches. The results of critical examinations of the genuineness and canonical character of the single books of the Bible, even when they were unfavourable to the books, have produced no alteration in the established canon. The reasons of the ancient fathers of the church for or against the canonical character of the Biblical books were merely historical and traditional, and built on philological criticism; they are still the most tenable and rational; the philosophical grounds are more subject to be affected by extraneous influences. Modern criticism has done its worst with small effect, or none, by calling into question the genuineness of single passages, as the learned Eichhorn candidly owns, after having collated a great number of versions and MSS., vainly trying to find fatal discrepancies.

CAÑON or CANYON. See CAÑONS.

CANONICAL BOOKS. See CANON, BIBLE, and APOCRYPHA.

CANONICAL HOURS are certain stated times of the day, devoted, more especially by the Roman church, to the offices of prayer and devotion, as matins, lauds, sixths, ninths, vespers. In England the canonical hours are from eight to twelve in the forenoon, before or after which marriage cannot be legally performed in any parish church.

CANONIZATION, a ceremony in the Roman Church, by which deceased persons are declared saints. Alexander III., in 1170, pronounced it an exclusive privilege of the Papal chair. This ceremony is one of the most solemn in the Roman Church. The pope institutes a formal investigation of the qualifications of the deceased person recommended for canonization, in which his manner of life and the genuineness of the miracles ascribed to him are strictly examined; and an *advocate of the devil*, as he is called, is appointed to assail the memory of the candidate, but, of course, always loses his cause. If the examination is satisfactory, the pope pronounces the beatification (which see) of the candidate; but in order to collect new proofs of his merits (for example, of miracles performed by his relics), the actual canonization generally takes place many years afterwards; and then a day, usually the anniversary of the death of the new saint, is dedicated to his honour, his name is inserted in the *canon*, that is the list or register, of the Saints (thence *canonization*), churches and altars are consecrated to him, and his remains are preserved as holy relics. See ADVOCATUS DIABOLI, and SAINTS.

CANON LAW. The famous Gravina begins his Institutes of the Canon Law thus:—Since the word *law* is imperative, and includes the idea of physical enforcement, the ancient church preferred to apply to its precepts the milder term of *rule* or *canon* (from the Greek *kanōn*, rule), which agrees with the language of the Council of Trent, and the most able canonists, as Van Espen, &c. Canons, therefore, are the laws which the church has promulgated; and by *canon law* in English is understood the whole body of ecclesiastical laws, ordinances, and regulations. The church has been from the time of its establishment a free society, possessing and exercising the right of forming laws for itself, either by positive enactment or by the gradual growth of custom. The regulations of the apostles, the decrees of the general and particular councils, and of the bishops, constitute these laws. Even when, after the downfall of Paganism, the Christian Church became connected with the state, it retained this legislative power. If the Theodosian code acquired authority it was only in consequence of *reception*. The more the organization of the church became settled the more frequent became the regulations and orders of the supreme bishop (the *decretals*). There is no question about the authority which was allowed to these decretals, and it is useless to inquire here whether this authority originated from positive enactment or from customary observance. The ecclesiastical as well as the political law is to be traced, in part, to each of these sources. In the course of time collections were made of these canons, arranged in chronological order (*Collectio Canonum*). These collections came into use in the fifth and sixth centuries. The chief basis of them was a translation of the decrees of the four first general councils, to which other decrees of particular synods and decretals of the popes were added. In the time of Charlemagne the collection of Dionysius the Little acquired almost the authority of laws. Equal authority, also, was allowed to the collection of canons ascribed to Isidore, Bishop of Seville, which appeared in the ninth century. This famous collection is falsely attributed to Isidore, and abounds in spurious interpolations. It was entitled the *Isidorian Code*, and is said to have been brought from Spain. The object of the interpolations of the *Pseudo-Isidore* was probably to give an historical basis to a system grown up out of observance, which transferred many of the former rights of the metropolitans to the pope. After the tenth century the custom which had before prevailed, of collecting chronologically the ordinances of the church, and studying them from the sources, was given up, and systematical compendiums of ecclesiastical law began to be drawn from these canons. In these compendiums, it is true, literal extracts of the canons were retained, but often mutilated, and separated from their proper connection. The most important of these compendiums is that of the Benedictine Gratian of Chiusi, which he finished in 1151, in the convent of St. Felix at Bologna. Gratian treated the subjects of the canon law according to a system which he had formed himself, and under each division laid down principles which he established by quotations from the original decrees. By means of these authorities, with additions of his own, he extended his principles further, and endeavoured to reconcile apparent contradictions in the law, or, where they could not be reconciled, to determine which part was binding. Hence the title of his work—Concordantia Discordantium Canonum. He divides the whole subject into three parts. In the first he begins with a general essay on law, particularly ecclesiastical law, and treats of the officers of the church, their character, rights, duties, consecration, and share in the government of the church; the second part contains the system of the powers of the church, particularly of its jurisdiction and judicial processes; the third part embraces the rules respecting religious rites, the liturgy, the sacraments, &c. Within ten years after its appearance the Universities of Bologna and Paris had their professors of canon law, who taught from Gratian's work; and in a short time it superseded all former chronological collections. As the civil law acquired authority in so many countries from the circumstance that it was taught in the universities, so the *Decretum Gratiani*, in the same way, became a code, and with more reason, since it expounded a law really existing; and what Gratian had added was, to a certain degree, considered as commentary. Any direct co-operation of the popes in elevating the *Decretum Gratiani* to the authority of a code has never been proved. This *Decretum*, however, is only the first part of the present *Corpus Juris Canonici*. After the appearance of the *Decretum* new decrees of councils and new decretals were promulgated, which several authors collected into appendices. All these new collections Pope Gregory IX. ordered to be put in order, which was done by the Dominican Raymond of Pennaforte. The work was divided into five books. This authentic collection was finished in 1234, and sent to the Universities of Bologna and Paris. It bears the name of *Decretales Gregorii Noni*, and has the authority of law. The later decretals and decrees of councils were collected by Boniface VIII., and published as the sixth book (*Liber Sextus*) of the Gregorian Decretals in 1298. They have also the authority of laws. Pope Clement V. published in 1313 a collection of his decrees, mostly issued at the council held at Vienne in France; they are also a part of the *Corpus Juris Canonici*. About the year 1340 the decretals of John XXII. were published; they are called *Extravagantes Johannis XXII.*; and at a later period the subsequent decretals, to the time of Sextus IV., who died in 1484, called *Extravagantes Communes*, appeared. These *Extravagantes* have not altogether the authority of law. Under Pope Pius IV. a commission of thirty-five persons (the *correctores Romani*) was appointed to revise the *Decretum Gratiani*. The labour was continued under Pius V., and completed under Gregory XIII., and sanctioned by a bull of July 1, 1580. The later bulls have the force of law, if they concern a subject on which the pope has an unquestionable right to legislate, or as far as the secular government accepts them. The canon law, excepting some of its regulations, is in force in Germany, even in civil cases. Luther, it is well known, burned a copy of the canon law at Wittemberg, but the Protestant courts have continued to apply it, except where it disagrees with Protestant principles. The canons, even those of the general councils, which respect the discipline of the church, had no authority in the Gallican Church, unless they had also been admitted as laws of the kingdom. The articles or declarations of the clergy of France, in 1682, were a series of very important canons, which for a considerable time might be considered both as the rules of the Gallican Church and as laws of the kingdom. Many Catholics are willing to admit that there exist arbitrary canons in the ecclesiastical codes, as much as unconstitutional laws in civil governments. In England, when the R. Catholic faith prevailed in it, there existed, besides the general canon law, the legatine and provincial constitutions; the former being laws enacted in national synods, held under the cardinals Otho and Othobon, legates from Pope Gregory IX. and Clement IV., about the years 1220 and 1268; the latter being decrees of various provincial synods, under several archbishops of Canterbury. The authority of the canon law in England, since the Reformation, depends upon the statute 25th Henry VIII., according to which the ecclesiastical laws were to be revised by the king and a commission of nobles and clergymen, and such as were not repugnant to the laws of the realm and the king's prerogative were to remain in force till so revised. This revision was never made, and consequently the laws then existing—with the proviso expressly contained in the statute referred to —are still in force in ecclesiastical matters. New and special canons were drawn up, however, in 1603 for the English clergy, and were revised in 1865. The canon law administered in the spiritual courts of England is distinguished as 'the king's ecclesiastical law', and the general canon law of the Roman church was never fully in force in England, nor had the same influence on English jurisprudence as it had on that of some countries, Scotland for instance. The law of Scotland by which children born out of wedlock are legitimized by subsequent marriage of their parents, was borrowed from the canon law; but when a proposal was made by the English bishops in 1236 that this should become the law of England, the famous reply of the nobles was 'Nolumus leges Angliæ mutari'—'We will not have the laws of England altered'.

CAÑONS (Spanish for *cannons, tubes*), a term applied in Spanish America and the w. of the United States to river courses forming tremendous chasms, with perpendicular, or nearly perpendicular, sides. Somewhat similar gorges are to be seen in different parts of the earth, especially in elevated regions, but nowhere are they so vast as in the region through which the Western Colorado and its tributaries flow; and nowhere is it so clearly seen that these tremendous chasms have been hollowed out in the course of ages by the rivers which traverse them. The Grand Cañon of the Colorado is 220 miles long, and has a depth of from 2500 to 6500 feet. Others almost as large, above the Grand Cañon, on the Colorado, and on the Green River, a northern tributary of the Colorado, also exist. The walls of the cañons of the Colorado consist of horizontal layers of sandstone, with marble and sometimes granite appearing here and there among them. See COLORADO.

CANOPIC VASES (sometimes called *canopi*) is the name applied to certain large-bellied vessels found in Egypt, which were placed in tombs, and contained the embalmed intestines of bodies that had been converted into mummies. Four of these were placed in a tomb, each appropriated to a particular deity, and surmounted by his head, either that of a man, an ape, a jackal, or a hawk, according to the deity. It is to those with the human head that the term *canopi* has been more particularly applied. They were frequently made of basalt, and decorated with figures in relievo or paintings; or of costly white alabaster, with spiral flutings; or they were formed from black burned clay. The name is from the town Canopus.

CANOPUS, or CANOBUS, an ancient Egyptian city, between Alexandria and the western mouth of the Nile. There was here a temple of Hercules, which was a secure asylum for fugitives, and also one of Serapis. The inhabitants, a mixed Egypto-Hellenic people, were noted for licentiousness.—In astronomy CANOPUS is the name of the brightest star except Sirius. It occurs in the constellation Argo.

CANOSA, a city of South Italy, in the province of Bari, 14 miles to the south-west of Barletta on the Adriatic. It was the ancient *Canusium*, and various relics of Roman times, including an amphitheatre, have been found. Between Barletta and Canosa was the ancient Cannæ, where in B.C. 216 Hannibal defeated the Romans. (See CANNÆ.) Tombs cut in rock on a hill have been found in the neighbourhood, and in 1813 a beautiful burial-chamber was opened, which contained the corpse of a warrior in armour. A copper lamp and a number of beautiful vases were also found here. The paintings upon the vases were the most important part of this discovery. They refer to the Greek-Italian mysteries. Pop. 18,843.

CANOSSA, a ruined mountain castle of northern Italy, 12 miles s.w. of Reggio. In the eleventh century it belonged to Countess Matilda of Tuscany, with whom Pope Gregory VII. resided in 1077, when he imposed a severe penance upon the excommunicated Emperor Henry IV. (See HENRY IV.) The phrase 'to go to Canossa' has come to be proverbial for some humiliating surrender, withdrawal, or the like.

CANOVA, ANTONIO, a celebrated modern sculpter, who has formed an epoch in Italian statuary. Canova may be considered as the restorer of the graceful and lovely style, and the founder of a new school, as far as it respects softness and delicacy of execution, and excellent handling of the marble. He was born Nov. 1, 1757, at Possagno, in the Venetian territory. The Falieri, father and son, sent him as an apprentice to a statuary in Bassano, where he acquired skill in the mechanical part of the art. His first work, executed in his seventeenth year, was an Eurydice in soft marble, of half the natural size. He was now sent to the Academy of Venice, where his proper study commenced. He gained several prizes, and excited expectations which he more than equalled in the sequel. The first work which he was commissioned to execute was the statue of the Marchese Poleni, of the natural size, for the city of Padua. In his twenty-fifth year he finished the group of Dædalus and Icarus, of the natural size, in Carrara marble, a remarkable juvenile work. The senate of Venice sent him, in 1779, to Rome, with a salary of 300 ducats. A group as large as life—Theseus Sitting upon the Slain Minotaur—was the first large work by which Canova made himself known in Rome (1783). In 1783 Canova undertook the execution of the tomb of Pope Clement XIV., in the church Degli Apostoli. He retained the usual style of composition, and only improved on the depraved taste of the school of Bernini. He next executed the group of Cupid and Psyche, where he first displayed his own peculiar style, of which loveliness is a striking characteristic. The figures are exceedingly delicate and graceful. He was employed on a second public monument, the tomb of Pope Clement XIII., in St. Peter's. It was finished in 1792, and is distinguished by its colossal size and simple style. Meanwhile the fame of the artist continually increased. He established in the palace of the Venetian ambassador a school for the benefit of young Venetians. His next works were a winged Cupid, standing; another group of Cupid and Psyche; a group of Venus and Adonis (in which the figure of the latter is particularly beautiful) for the Marchese Verio, in Naples; the tomb of the Venetian Admiral Emo, for the Republic of Venice. This is a combination of bass-reliefs with figures in full relief. Canova also produced a very lovely Psyche, standing, half-dressed, with a butterfly in her left hand, which she holds by the wings with her right, and contemplates with a calm, smiling mien. A Repentant Magdalene, of the natural size, belongs to the works in marble in which he has carried the expression of the melting and the soft to the highest degree. His Hebe is a delightful figure. In an easy and animated attitude the smiling goddess of youth hovers upon a cloud, pouring nectar with her right hand into a bowl which she holds in her left. Both vessels, as well as the coronet of Hebe and the edges of her garment, are gilt. Canova is fond of a variety of material, and often endeavours to give to his statues the effect of pictures. He next displayed his talent for the tragical in the raging Hercules hurling Lichas into the Sea. The group is colossal, and Hercules somewhat larger than the Farnesian; but it makes a disagreeable impression, which proves that the genius of Canova was not adapted to such subjects. His representation of the two pugilists, Kreugas and Demoxenos, is much more successful. A standing group of Cupid and Psyche was the triumph of his art. Psyche here appears again holding the butterfly. In 1796 and 1797 Canova finished the model of the celebrated tomb of the Archduchess Christina of Austria, wife of Duke Albert of Saxe-Teschen, which in 1805 was placed in the church of the Augustines at Vienna. In 1797 he made the colossal model of a statue of the King of Naples, one of his finest works. This statue, 15 palms high, was executed in marble in 1803. During the revolution of 1798 and 1799 Canova accompanied the senator prince, Rezzonico, on a journey through Germany. After his return he remained for some time in the Venetian territory, and painted for the church of his native village an altar-piece, in which are represented the dead Christ, the Maries, Nicodemus, and Joseph, and, on high, God the Father. He afterwards executed in Rome his Perseus with the Head of Medusa, which, when the Apollo of Belvidere was carried to France, occupied its place and pedestal. This statue increased the fame of Canova more than any of the preceding works. But Perseus is only an imitation of the Apollo. The separate parts are of exquisite beauty in form as well as in masterly, delicate finishing. In 1802 he was invited by Bonaparte to Paris to make the model of his colossal statue. In the beginning of 1803 the model of the emperor's bust, and afterwards that of his statue, was to be seen in the workshop of the artist. There is not a more successful work of the kind than this bust: the figure of the statue is not so good. Among the later works of the artist are a Washington, of colossal size, in a sitting attitude; the tombs of the Cardinal of York and of Pius VII.; an imitation of the Medicean Venus; a Venus Rising from the Bath; the colossal group of Theseus killing the Minotaur, far surpassing his earlier works in the heroic style; the tomb of Alfieri, for the Countess of Stolberg, in Florence, and erected in that place (the Weeping Italia, a colossal statue in marble, is particularly admired); the Graces Rising from the Bath; the monument of the Marchioness of S. Croce; a Venus; a Dancing Girl, with almost transparent garments; a colossal Hector; a Paris; a Muse, larger than the natural size; a model of a colossal Ajax; and the model of a sitting statue, in rich robes, of the Archduchess Maria Louisa of Austria. After the second fall of Napoleon, in 1815, Canova was commissioned by the pope to demand the restoration of the works of art carried from Rome; went from Paris to London, and returned to Rome in 1816, where Pius VII. inscribed his name in the golden book of the capitol, declared him 'to have deserved well of the city of Rome,' and made him Marquis of Ischia, with a pension of 3000 scudi. Canova died at Venice, Oct. 13, 1822.

As a man Canova was active, open, mild, obliging, and kind towards everybody. His opinion of himself was very modest, notwithstanding his fame was spread through all Europe. He assisted promising young artists, and established prizes for the encouragement of the arts. When the pope conferred upon him the title of Marquis of Ischia, with a pension, he dedicated the whole of the latter to the support and encouragement of poor and deserving artists. Canova was also an agreeable painter, but, strangely enough, more of a colourist than a correct designer. See the Life of Canova by Missirini, four vols., Prato, 1824; the biographies of Rosini, Pisa (1825), and d'Este, Florence (1864). Engraved representations of all his works have appeared in Italy and at Paris.

CANSTEIN, CHARLES HILDEBRAND, VON, founder of a famous establishment for printing Bibles which goes under his name, was born in 1667 at Lindenberg in Germany, studied at Frankfort-on-the-Oder, travelled much in Europe, went in 1688 to Berlin, where he was appointed page of the Elector of Brandenburg, and served as a volunteer in the Netherlands. A dangerous sickness obliged him to leave the military service. He went to Halle, where he became familiarly acquainted with Spener and Francke, and became eager to spread a knowledge of religion among the common people. He was especially anxious that the poor should have bibles at as low a rate as possible, and thus originated the famous institution, called the Canstein Bible Institution, which after the death of Canstein in 1719 became associated with the institutions founded by Francke, and still continues its benevolent operations.

CANTABILE, in music, a term applied to movements intended to be performed in a graceful, elegant, and melodious style.

CANTABRI, the rudest and most valiant of all the Iberian tribes, who dwelt in the ancient *Hispania Tarraconensis*, and inhabited the greater part of what is now La Montana and the N.W. part of the present province Burgos. In ancient history *Cantabri* is generally used to denote all the inhabitants of the northern mountains of Spain. *Cantabria* is the name which was given to the country they inhabited. *Oceanus Cantabricus* is the ancient name of the Bay of Biscay. *Cantabrian Mountains* is the general name of the various mountain ranges extending from the western Pyrenees along the N. coast of Spain to Cape Finisterre. The highest of the ranges, the Sierra d'Aralar, attains an altitude of 7032 feet. These mountains are imperfectly known, but in parts they are covered with magnificent forests, and from those of Santander the snow never entirely disappears.

CANTACUZENUS, JOHN, a Byzantine emperor and historian, was born about 1300. While minister of Andronicus III. he negotiated a favourable peace with the Genoese in 1336, and repelled the encroachments of the Turks in 1337. On the death of Andronicus in 1341 Cantacuzenus became regent during the minority of the young emperor, John Palæologus. He defeated the Bulgarians and Turks, assumed the diadem, and entered Constantinople, victorious over his rivals, in 1346. He used his power with moderation, and endeavoured to heal the wounds which five years of civil war had inflicted on the state; but religious disputes, civil dissensions, and foreign enemies soon disturbed his government; and the jealousy of Palæologus, the rebellion of his own son, war, plague, the frightful disorders which prevailed in the empire, and his own loss of popular favour, induced him to renounce the crown. He retired to a monastery (1355), where he employed himself in literary labours. He is considered one of the greatest among the successors of Constantine. His Four Books of Byzantine History were printed in 1645 (Paris, three vols. folio), and belong to the collection of the Byzantine historians. His other works, principally theological, are partly printed and partly in manuscript.

CANTAL, a department in France, bounded N. by the departments of Corrèze and Puy-de-Dôme, E. by departments Lozère and Haute Loire, S. by Lozère and Aveyron, W. by Lot and Corrèze; between lat. 44° 38′ and 45° 28′ N.; lon. 2° 5′ and 3° 20′ E. Area, 2217 square miles; capital, Aurillac. This department, formerly part of Upper Auvergne, is named from its highest mountain, the Plomb du Cantal, *Mons Celtorum* of the ancients, which rises to the height of 6094 feet. The department is one of the poorest and least productive districts of France—the greater part of it being occupied by the Cantal Mountains, and high lands, furnishing only timber, archil, and pasture. The mountains are of volcanic origin; and the quantity of lava emitted has been so great as apparently to have filled up many of the original valleys and converted them into table-land. It is watered by numerous rivers, the principal of which are the Dordogne, Cère, and Lot. Climate rather severe near the mountains. Agriculture, though the chief stay of the inhabitants, is in a backward state. The principal crops are rye, buckwheat, potatoes, and chestnuts—the last to a large extent—and some hemp and flax. Of wheat and oats the produce is insufficient for the consumption. Cattle, sheep, horses, and mules are reared in large numbers; and on the refuse of the dairies numerous pigs are fed. The fat cattle from this department are much esteemed, and are sent to all parts of the country. Large quantities of cheese are made, and sold principally in the s. of France under the name of Auvergne cheeses. The minerals, as a whole, are unimportant. Hot mineral springs are abundant, those of Chaudes-Aigues being the most frequented. The manufactures are of trifling importance. Large numbers of the inhabitants, apparently from want of winter employment, have, from time immemorial, emigrated annually to Spain, or to other parts of France. Cantal is divided into four arrondissements, containing 23 cantons and 267 communes. Pop. in 1896, 234,381.

CANTATA, in music, a species of vocal composition, consisting of an intermixture of air, recitative, duet, trio, quartette, and chorus. It was invented some say by Carissimi, about the middle of the seventeenth century. The subject may be sacred, pastoral, or amatory, and in the hands of some composers it takes the dimensions of a short oratorio or opera, but without acting. Mozart, Beethoven, Mendelssohn, and other great musicians have composed cantatas, and among English composers we may mention Purcell, Sterndale Bennett, Macfarren, and Henry Smart.

CANTEEN, a place of refreshment established in barracks of the British army for the exclusive use and convenience of the troops, and for supplying them with malt liquor, wine, groceries, and other articles at reasonable prices. Spirituous liquors are not sold in canteens on home stations. The greater number of the canteens are regimental canteens managed by a standing committee of three officers, who superintend the whole business of the canteen, a canteen sergeant being appointed as steward or salesman.

CANTEMIR, Demetrius, was born in Moldavia in 1673. At the age of fifteen he was sent as a hostage to Constantinople, where he remained four years. He served his first campaign in 1692, under his father, upon whose death, in the succeeding year, he was chosen Prince of Moldavia at the age of twenty. This choice was not confirmed by the Porte, and he was ordered to reside at Constantinople, where his abilities soon gained him the favour of the government; and he was twice nominated hospodar of Moldavia. He successfully used his influence to transfer that dignity to his brother. He was appointed the third time, in 1710, with the promise of the annexation of Walachia, and exemption from tribute. Notwithstanding this promise, as soon as he was invested with his office, he was called upon for the amount usually paid on such occasions. He entered, therefore, into a treaty with the Czar Peter, by the terms of which the principality was to be hereditary in the family of Cantemir, under the protection of the czar, whom Cantemir was to assist in his war with Turkey. The czar, however, being abandoned by the Poles and betrayed by the Moldavians, was obliged to retire, and Cantemir took refuge in his dominions, with the rank of Prince of the Russian Empire. He died at Astrakhan in 1723. His principal work is called History of the Growth and Decay of the Ottoman Empire (in Latin). It has been translated into English (London, 1734, two vols. folio), French, and German. He is the author, likewise, of the Present State of Moldavia (in Latin), and the System of the Mohammedan Religion, which have both been published.

CANTERBURY, a city and parl., mun. and county borough in Kent, 55 miles s.e. of London, on the river Stour. It is supposed to have been a place of importance before the Roman invasion, the Roman name *Durovernum* showing apparently the British prefix *Dwr*, water, although antiquaries differ as to the remainder of the compound. Druidical remains have been found here, together with the British weapons termed celts. Its importance under the Roman dominion is proved by many circumstances; and especially by the discovery of a great variety of remains of that people; added to which, Roman bricks have been found in certain portions of the remaining walls. It derives its present name from the Saxon *Cant-wara-byrig*, the Kentishmen's city. During the residence of Ethelbert, king of Kent, the memorable arrival of St. Augustin took place in 596; an event which was rapidly followed by the conversion of this king and his people to Christianity; and the foundation of the archiepiscopal see of Canterbury. In the eighth, ninth, tenth, and eleventh centuries, the city was dreadfully ravaged by the Danes, and on one occasion, in 1011, nearly the whole of the inhabitants, including women, children, and the archbishop himself, were barbarously massacred, and the cathedral burned to its bared walls. It gradually, however, recovered, and at the Conquest its buildings exceeded in extent those of London. The ecclesiastical importance of the place, in particular, advanced with great rapidity, which was consummated by the murder of Thomas à Becket, whose politic canonization by the pope rendered Canterbury the resort of pilgrims from every part of Europe. Not only were the priory and see benefited by the offerings of the rich devotees, but the prosperity of the town itself was greatly advanced by the money spent in it by so many wealthy strangers. Erasmus describes the church, and especially the chapel in which he was interred, as glittering with the gold and jewels offered up by the princes, nobles, and wealthy visitors of his shrine; all of which Henry VIII. appropriated to himself on the dissolution of the priory in 1539, when he ordered the bones of Becket to be burned to ashes. Several of the English monarchs have made a temporary residence at Canterbury, which was also occupied by Oliver Cromwell in the civil wars, whose troopers made a stable of the cathedral.

Canterbury is beautifully situated in a fertile vale, surrounded by gentle eminences, which supply numerous streams of excellent water. The principal thoroughfare is wide, the houses well built, and the streets in general well paved and lighted. It extends about ½ mile e. to w., and rather more n. to s., with four suburbs at the four cardinal points. From all points Canterbury presents a picturesque appearance, its antique features contrasting finely with the sylvan scenery around. The most remarkable object in the city is the cathedral, one of the finest ecclesiastical structures in England. The original building, of which no part now remains, was of great antiquity, the distinction having been claimed for it of being the first Christian church in the kingdom. The present edifice, 530 feet in length, e. to w., and

154 in breadth, has been built in different ages (the oldest part dating from the eleventh century), and presents in consequence various styles of architecture (including the Norman and Early English), but retains altogether an imposing appearance. The great tower, 235 feet in height, is one of the most beautiful specimens of the Perpendicular style of Gothic; and the choir is also very fine. St. Augustine's monastery, now a church missionary college, is another fine building. The N. gate is particularly handsome, and is a fine specimen of the Decorated style of architecture. St. Margaret's church has been restored in excellent taste; and the church dedicated to St. Martin, which stands on a hill at some distance from the city, and is believed to be one of the oldest existing Christian churches, has also been restored. There are, besides, numerous chapels and places of worship for various religious sects. Other public buildings are the guild-hall, the corn-exchange, and a theatre. In addition to the royal grammar-school, founded by Henry VIII., there are numerous other schools, a mechanics' institution, museum and free library, an hospital, dispensary, and numerous other charitable institutions. In 1882 Sidney Cooper, R.A., presented an art gallery to the city. Canterbury was formerly noted for its silk manufactures, afterwards supplanted by a superior kind of damask linen, which in turn has become extinct. There are several extensive breweries and malting establishments in the town, and leather, bricks, lime, ropes, &c., are manufactured. The principal articles of trade are corn and hops, in the cultivation of the last of which a number of the labouring class are employed. There are extensive barracks for cavalry and infantry. Canterbury sent two members to the House of Commons from Edward I.'s reign till 1885, when it lost one.

The Archbishop of Canterbury is primate and metropolitan of all England, and first peer in the realm after the royal family. He places the crown on the sovereign's head at the coronation, and wherever the court may be the king and queen are deemed his parishioners. The four prelates of London, Winchester, Lincoln, and Rochester, are respectively his provincial dean, sub-dean, chancellor, and chaplain. His province comprehends the sees of twenty-four suffragan bishops, and he has the nomination of the several officers belonging to the ecclesiastical courts over which he presides, and the privilege of conferring degrees in the faculties of law and divinity; formerly (till 1858) also of medicine. Pop. in 1891, 23,026; in 1901, 24,868.

CANTERBURY, a provincial district of New Zealand occupying the centre of South Island, about 200 miles in length from N.E. to S.W., and about 150 miles in greatest breadth from E. to W.; with a coast-line of about 240 miles. It has Nelson district on the north, Otago on the south, Westland on the west, and the sea on the east. The western part is traversed by ranges of mountains. The famous Canterbury Plain, of 2,500,000 acres, slopes gradually down over a descent of 40 miles towards the sea. The principal coast feature in the contour of this province is Banks' Peninsula, a projection consisting of an assemblage of densely wooded hills, and containing the harbours of Port Victoria or Cooper, Port Levy, Pigeon Bay, and Akaroa. A rich loamy tract, admirably adapted for agriculture and cattle grazing, extends along the E. coast, while the interior, comprising the great plain already mentioned, is a true pastoral country, well watered by numerous streams, and covered with a perpetual herbage of various grasses. Except in Banks' Peninsula and at the foot of the interior highlands, Canterbury is remarkably destitute of trees. A vast coal-field seems to underlie the whole country, and coal is worked in the districts of Timaru and Malvern. Many hundreds of square miles are known to be more or less auriferous, but the province has not developed so rapidly as it might have done. Good fireclays, quartz, sand for glass-making, marble, limestone, &c., are also found. Medicinal hot-springs adapted for the cure of rheumatism and skin-diseases occur at Hanmer Plains, 90 miles north of Christchurch. The productions of the province include wool, grain, frozen meat, skins and hides, butter, cheese, and some silk. The chief places in the province are Christchurch, the capital, on the river Avon; and Lyttelton, the port town, on Port Victoria, 8 miles from Christchurch. The colony of Canterbury was established in the year 1850 mainly by members of the Church of England. Area, 14,040 square miles. Pop. in 1891, 128,471; in 1896, 135,858.

CANTHARIDES, or SPANISH FLIES, in medicine, the name of a kind of fly, or rather beetle, the *Cantharis* or *Lytta vesicatoria*, as dried and used for blistering or other purposes. These insects are common in Spain, Italy, and France, where they are found on the ash, lilac, viburnum, &c.; but the greatest quantities and best qualities come from St. Petersburg. Their body is from 6 to 10 lines long; the feelers are black, setaceous, composed of twelve articulations; the elytra long, flexible, of a shining golden-green; and the tarsi of a deep-brown. They have a strong, penetrating, and unpleasant odour, and their taste is extremely acrid. They are dried and pounded into a powder of a brownish-gray, intermixed with shining particles of a metallic green colour. They contain, with several other ingredients, a peculiar substance called *cantharidin* (which see). When used as a vesicating substance their action is principally confined to the skin; but their active principles may be absorbed into the system and cause serious results. The application of a blister is often followed by strangury, hæmaturia, priapism, &c. Taken internally cantharides act as a most energetic acrid poison; they produce irritation on the intestines, and especially affect the genito-urinary organs, which they stimulate violently. In certain disorders they are administered in small doses, as powerful stimulants. The medicine is of a very dangerous character, and its use requires the greatest caution on the part of the physician. Several species of blistering fly are found in America, some of which are even more powerful than the Spanish fly.

CANTHARIDIN ($C_{10}H_{12}O_4$), the vesicating principle of cantharides. The methods of obtaining it consist in treating the powdered insects with a solvent, such as alcohol, ether, or chloroform, the last being preferable. The solution is evaporated, and the residue is purified from a green oil which adheres to it obstinately, by digesting with bisulphide of carbon or by redissolving in alcohol. Purification is further effected by animal charcoal, and the cantharidin is crystallized from hot alcohol or chloroform. It forms white crystalline scales, which fuse when heated and sublime, evolving an extremely irritating vapour. It is insoluble in water, but when mixed with the oils from the insect it is soluble. Chloroform is its best solvent, but it is taken up more or less freely by alcohol, ether, mineral acids and alkalies, and a variety of organic fluids. From most of these it is reprecipitated unchanged by diluting with water, or by neutralizing with the necessary reagent.

CANTICLES. See SOLOMON'S SONG.

CANTIUM, an ancient territory in South Britain, whence the English word *Kent* is derived, supposed to have been the first district which received a colony from the Continent. The situation of Cantium occasioned its being much frequented by the Romans, who generally took their way through it in their marches to and from the Continent. Few places in Britain are more frequently mentioned by the Roman writers than Rutupiæ (now *Richborough*). Portus Dubris (now *Dover*), Durobrivæ, and Durovernum (now *Rochester* and *Canterbury*) were also Roman towns and stations. Cantium made a part of the province called *Flavia Cæsariensis*. See KENT.

CANTO FERMO, the name given to the ancient chants of the Roman Catholic Church, which were adopted as standing melodies. These chants, until counterpoint was discovered, were unaccompanied, or only harmonized with octaves.

CANTO FIGURATO. This term was applied by the old Christian ecclesiastics to the chant in its more florid forms, or in which more than one note was sung to a syllable.

CANTON (more correctly *Quang-chow-foo*), a large and important city of southern China, is situated on the Pearl River (here about the width of the Thames at London Bridge) at a distance of 80 miles from the sea. It is situated in the province of Quang-tung (of which name *Canton* is a corruption), and consists of the city proper and of many suburbs, and its total population is estimated at over 1,000,000. The city proper is inclosed by walls, forming a circuit of six miles, and is divided into two parts by a partition wall running east and west; the portion north of this wall, which is much the larger portion, being called the old, that on the south of it the new city. The walls, mainly of brick, rise to the height of 25 feet with a thickness of about 20. There are twelve gates, all of which are shut at night. The streets are long and straight and in general paved with flat stones, but they are very narrow, the average breadth not exceeding 8 feet. The houses of the poorer classes are mere mud hovels; those of the shop-keeping class are commonly of two stories, the lower of which serves as the shop. The streets are to a great extent lined with these shops, in which are to be found the productions of all parts of the globe. Neat and gaudily painted signs and names give a gay appearance to the narrow streets; in most cases there are no windows in front, but the whole is thrown open by day and closed at night. Temples and other religious edifices are very numerous, but few of them are in any way remarkable. There are two lofty pagodas, forming a notable feature in any general view of the city. One of these, 170 feet in height, is about 1300 years old, the other, 160 feet high, about a thousand. Among the chief temples, which are far from attractive buildings, may be mentioned those of the Ocean Banner, of the Five Hundred Gods, of Longevity, of the Five Genii. Among other buildings may be mentioned the residences of the governor-general, the commander-in-chief, the treasurer, the prefect, &c. There are four large prisons, one of them capable of containing 1000 prisoners. In the European quarter are churches, schools, and other buildings in the European style. Wheeled carriages are not in use in Canton; goods are transported on bamboo poles laid across the shoulders of men, while people who can afford it have themselves carried about in sedan-chairs. The river opposite the city for the space of four or five miles presents a most interesting scene. The prodigious number of boats with which it is crowded is the first thing that strikes the eye. A large number of these—as many it is said as 40,000, containing a population of 200,000—are fixed residences, and most of them moored stem and stern in rows. The inhabitants are called *tankia* or boat-people, and form a class with many customs peculiar to themselves. Millions are born and live and die in these floating dwellings without ever having put foot on dry land; while their ancestors for generations were all amphibious like themselves. The family-boats are of various sizes, the better sort being from 60 to 80 feet long, and about 15 feet wide. A superstructure of considerable height, and covered with an arched roof, occupies nearly the whole of the interior of the boat. This structure is divided within into several apartments, devoted to different domestic purposes, all of them being kept very clean. The smaller boats of this description are not above 25 feet long, and contain only one room. By far the handsomest boats are the *hwa-ting* or flower-boats, which are graceful in form and have their raised cabins and awnings fancifully carved and painted. These are let to pleasure-parties for excursions on the river. The foreign mercantile houses, and the British, French, and American consulates, have as their special quarter an area in the suburbs in the south-west of the city, with water on two sides of it. The river banks are faced with a granite wall; handsome *hongs* or factories have been built, and much money has been spent on improvements. The manufactures and other industries of Canton are varied and important, embracing silk, cotton, porcelain, glass, paper, sugar, lackered ware, ivory carving, metal goods, &c. Its foreign trade has been known for three centuries throughout the world, and it was the chief foreign emporium in China until 1850, when Shanghai began to surpass it. Since then the opening of other ports and different causes have interfered with its prosperity, but it still carries on a large traffic, its exports and imports together often amounting to about £8,000,000. Business transactions between natives and foreigners are transacted in a jargon known as 'pidgin-English.' Since the establishment of the colony of Hong-Kong there has sprung up quite a flotilla of river steamers, which ply daily between Canton, Hong-Kong, and Macao, and convey the greater part of the produce and merchandise for native and foreign consumption. These steamers equal the best river boats of Europe, and carry large numbers of passengers. The climate of Canton is healthy; in July and August the thermometer may rise to 100° Fahr. in the shade, and during winter it is at times below the freezing-point. Canton was first visited by English vessels in 1634. From 1689 to 1834 the East India Company had a monopoly of the English trade. In 1839 war was declared by Britain against China, and Canton would have been occupied but for being ransomed by the Chinese. In the war of 1856 the foreign factories were pillaged and destroyed, and about a year after this Canton was taken by an English force. From this time to 1861 it was occupied by an English and French garrison.

CANTONMENT is the district in which troops are quartered when they are not collected into a camp (which see), but detached and distributed over the neighbouring towns and villages. The object of sending troops into cantonments is to be able to concentrate them as quickly as possible on one spot, when circumstances do not admit of a camp being formed, or do not render it advisable to form one. In India the permanent military stations erected in the neighbourhood of the principal cities are so called.

CANT TIMBERS, in ship-building, those timbers which are situated at the two ends of a ship. They derive their name from being *canted*, or raised obliquely from the keel, in contradistinction from those the planes of which are perpendicular to it.

CANTYRE, or KINTYRE, a peninsula, Scotland, between the Firth of Clyde and the Atlantic, forming the southern division of Argyleshire, to the more northern portion of which it is united by the isthmus of Tarbert. It is 40 miles long, with an average breadth of about 7 miles, and a surface agreeably diversified. At the S.W. point, called the Mull of Cantyre, is a light-house with a fixed light 297 feet above the sea level; lat. 55° 20′ N.; lon. 5° 49′ W.

CANUTE I., King of England and Denmark, succeeded his father Sweyn, on his death in 1014 A.D. The barbarities committed by the Danes in England excited Ethelred II., the twelfth king of English descent, to a bloody vengeance. In 1002 he caused all the Danes to be massacred on the same day. The sister of Sweyn, then king of Denmark, he caused to be beheaded in his presence. Sweyn landed in England, and laid waste the country with fire and sword. Ethelred escaped to Normandy. Sweyn died 1014, before he had time to confirm the Danish power in the island. This was accomplished, however, by Canute. He began his reign by devastating all the eastern coast of his new kingdom, and causing the English, who were given to his father as hostages, after he had cut off their noses and hands, to be drowned at Sandwich. He then received reinforcements from Denmark, and extended his ravages in the south of England, where, however, he failed to establish himself until after the assassination of Edmund Ironside. At a general assembly of the states he induced false witnesses to affirm that Edmund had appointed him heir to his crown, to the prejudice of his two minor children. After the assembly had confirmed this settlement Canute sent the two young princes to the King of Sweden, with the request that he would put them to death. The latter, however, sent them to Hungary, where they met with the kindest reception. Canute, who had begun his reign with barbarity and crime, afterwards became humane, and finally pious, or even superstitious. He restored the English customs at a general assembly and insured to the Danes and English equal rights and equal protection of person and property. His power was confirmed by his marriage with Emma, Ethelred's widow. He now made two expeditions to the Continent, one to conquer Sweden, and the other to reduce Norway. But he was at length brought to feel the vanity of earthly greatness. He erected churches and monasteries, and even performed a pilgrimage to Rome, where he obtained important privileges for the schools of England. It was this spirit of piety that gave rise to the story of his seating himself upon the strand, and commanding the waves to retire that he might confound his flatterers. His last expedition was against Malcolm, king of Scotland. He died four years after, A.D. 1036, at Shaftesbury. By his will he left Norway to his eldest son, Sweyn; to the second, Harold, England; to the third, Hardicanute, Denmark.

CANVAS, a textile fabric made of the fibres of hemp; or any strong, firm cloth whether of hemp or flax. It is chiefly used for tents, and for the sails of sailing vessels, for which its strength makes it well adapted. Varieties of it are also used as the ground of tapestry work and of oil paintings. A finer description is used for many common domestic purposes, as for towels, table-cloths, &c.

CANZONE, a kind of lyric poem, of Provençal origin. It is found in the Italian poetry of the thirteenth century. At first it was quite irregular, but was confined by Petrarch to more fixed and regular forms. Hence it is called *canzone Petrarchesca:* it is also called *canzone Toscana*, because it originated in Tuscany. It is divided into several stanzas, in which the nature and disposition of the verses, which are of eleven and seven syllables, and the place of the rhymes, are uniform. The canzone usually concludes with a stanza which is shorter than the others, and is called *ripresa*, *comgedo*, *comiato*, signifying dismission or taking leave. There are different kinds of canzoni, and different names are given to the different parts. The *canzone Anacreontica* is divided into small stanzas, consisting of short verses, with a regular disposition of the rhymes through all the stanzas. Not only light, pleasing songs of love, gayety, and mirth, but poems on solemn and lofty subjects, and of an elevated dithyrambic strain, are included under this name. The latter subjects, however, are better adapted to the *canzone Pindarica*, which was first introduced in the sixteenth century, by Luigi Alamanni, and owes its perfection chiefly to Chiabrera. It is distinguished from that of Petrarch by a bolder flight, loftier ideas, greater freedom in the choice and disposition of the verses, and by the form of the stanzas, which is borrowed from the Greek chorus. The Pindaric canzoni are divided into *strophe*, *antistrophe*, and *epode*, and are called *canzoni alla Greca.* Those divisions are sometimes called *ballata*, *contraballata*, and *stanza;* or *volta*, *rivolta*, and *stanza;* the Greek names are the most common. There is also the *canzone a ballo*, an old Italian poem, originally intended to be sung at a dance (*ballo*). It is called also *ballata.* It is not employed by the Italian poets later than the sixteenth century.

CANZONET, Canzonetta, in Italian poetry a canzone (see preceding article), consisting of short verses, much in use with the poets of the fifteenth century. Rinuccini, and after him Chiabrera, have used it in modern times, and given it more grace. Canzonets are generally expressive of tender feelings.—In music, *canzonet* signifies a song, shorter and less elaborate than the *arie* of the oratorio or opera.

CAOUTCHOUC. This substance, sometimes termed *gum elastic*, and commonly, from its application to remove pencil-marks from paper, *india-rubber*, is obtained from the milky juice of several plants, which are natives of the torrid zone, and inhabit America, Africa, and the East Indies. The chief of these are the *Siphonia elastica* (*Hevea elastica*) of South America; the *Ficus elastica* of the East Indies; three varieties of *Vahea* belonging to Madagascar, and a *Landolphia* inhabiting the W. coast of Africa. In its solid state caoutchouc is of a close texture, of a light brown colour, or sometimes nearly white. Its elasticity is such that it can be stretched to a great extent; and, on removing the stretching force, it recovers its original dimensions. It becomes hard, but not brittle by cold. Its softness and pliancy are increased by heat. Boiling water renders it so soft, that two slips, newly cut and pressed closely together, may be firmly united. By a greater heat it is fused, and may, in that state, be applied, as proposed by Mr. Aitkin, to the surface of steel instruments, which it will cover with a transparent film, that effectually preserves them from rust. After fusion it remains soft, and does not recover its original properties. It is insoluble in alcohol and in water, but when acted upon by ether, benzol, or bisulphide of carbon, it swells up and appears to dissolve. This, however, is really a separation of the caoutchouc into two parts, one soluble in the fluid, and the other insoluble. By successive treatment with fresh portions of the solvent this soluble part can be removed, leaving the elastic tenacious part behind. Dissolved in naphtha, it is employed in making waterproof cloth Its best solvent is a mixture of 1 part alcohol and 12 to 14 parts bisulphide of carbon. It is not acted on readily by the alkalies, or by hydrochloric acid, but it is attacked to a greater or less extent by strong sulphuric and nitric acids.

It was not until about the year 1736 that this very extraordinary natural production was made known in Europe. Until lately the greater part of the caoutchouc imported into Europe came from South America; but now it is brought in considerable quantities from the East Indies, and also from Africa and Central America. The best quality comes from Para at the mouth of the Amazon; the next best is that brought from Madagascar. It is obtained by making incisions through the bark of the tree, chiefly in wet weather. From the wounds thus formed the juice flows abundantly. It is of a milky-white colour, and is conducted by a tube or leaf, supported by clay, into a vessel placed to receive it. It is usually brought to Europe in the form of pear-shaped bottles, which are formed by spreading the juice over a mould of clay, exposing it to a dense smoke, or to a fire, till it becomes so dry as not to stick to the fingers, when, by certain instruments of iron or wood, it is ornamented on the outside with various figures. This done, the clay in the inside is moistened with water, and picked out. Caoutchouc was at first only used to rub out pencil-marks, but its applications are now very numerous, and are increasing every year. One of the most important is for the insulation of the wires in the electric telegraph. Even before the end of last century it was used to render leather and other substances water-tight. In 1823 Macintosh took out a patent for the waterproof materials prepared with caoutchouc which bear his name. From its softness, elasticity, and impermeability to water, it is applied to the formation of catheters, bougies, and tubes for conveying gases. These are formed by twisting a slip of it round a rod, and causing the edges to adhere by pressure, when softened by maceration in warm water. It is also used for over-shoes, and its solution in oils forms a flexible varnish. The *vulcanization* of caoutchouc enables it to be employed for a great number of purposes for which it is otherwise unfit. The method of vulcanizing, first discovered in America by Goodyear, and afterwards independently, in England, by Hancock, consists in the combination of sulphur with caoutchouc at a certain temperature. When a comparatively small quantity of sulphur is combined with caoutchouc it remains elastic, but is not so apt to dissolve or adhere to other substances as the pure caoutchouc, when exposed to heat. When a greater quantity of sulphur is introduced the caoutchouc becomes hard and horny, and goes under the name of *ebonite* or *vulcanite.* See EBONITE. Gutta-percha is a similar substance to caoutchouc, and is often popularly confounded with it. It has very little elasticity. See GUTTA-PERCHA.

CAP, the cover of the end or head of anything. Caps were not worn by the Romans for many ages. When either the rain or sun was troublesome the lappet of the gown was thrown over the head; and hence all the ancient statues appear bareheaded, excepting sometimes a wreath or the like. The same usage prevailed among the Greeks, to whom, at least during the heroic age, caps were unknown. The sort of caps or covers of the head in use among the Romans, on divers occasions, were the *pitra, pileus, cucullus, galerus,* and *palliolum,* which are often confounded by ancient as well as modern writers. The general use of caps and hats is referred to the year 1449. The first seen in Europe were used at the entry of Charles VII. into Rouen. From that time they began to take the place of *chaperons* or hoods. When the cap was of velvet they called it *mortier;* when of wool simply *bonnet.* None but kings, princes, and knights were allowed to use the *mortier.* The cap was the head-dress of the clergy and graduates. Pasquin says that it was anciently a part of the hood worn by the people of the robe; the skirts whereof being cut off, as an incumbrance, left the round cap an easy commodious cover for the head; which cap, being afterwards assumed by the people, those of the gown changed it for a square one, first invented by a Frenchman called Patrouillet. He adds, that the giving of the cap to the students in the university was to denote that they had acquired full liberty, and were no longer subject to the rod of their superiors, in imitation of the ancient Romans, who gave a *pileus* or cap to their slaves, in the ceremony of making them free: whence the proverb *vocare servos ad pileum:* hence, also, on medals, the cap is the symbol of Liberty, who is represented holding a cap in the right hand by the point.

Cap of Maintenance, one of the ornaments of state carried before the sovereigns of England on the occasion of their coronation. It is also applied to an ornament borne before the mayors of certain cities on state occasions, and to a device in heraldry.

In shipbuilding *cap* is a square piece of timber placed over the head or upper end of a mast, in which is a round hole to receive the top or top-gallant masts, which are thus kept steady and firm.

CAPACITY, SPECIFIC INDUCTIVE, a term introduced by Faraday, the discoverer of the property, to denote the relative powers or capacities of insulating media, called by him dielectrics, for transmitting electrostatic inductive influence. When an electrified body is brought near to a non-electrified conductor, an electric disturbance takes place at the surface of the latter, electricity of the kind opposite to that which the charged body possesses being attracted and the opposite kind being repelled. This disturbance is said to be due to *induction.* (See INDUCTION, ELECTROSTATIC.) Faraday discovered that it depends for intensity on the nature of the insulating medium between the two bodies, showing that, other things remaining the same, the disturbance is greater with some media than with others. The view that Faraday took of induction was altogether opposed to that which was held previous to the time of his investigations, and which was expressed by speaking of induction as action of electricity *at a distance:* and by experiments on liquid insulators, and in other ways, he proved that what was looked on as influence at a distance is really an influence transmitted by means of the intermediate particles of the insulating substance. The medium he termed the *dielectric.* He showed that the particles of the dielectric are in a polarized condition when it is exposed to electric force. (For a full exposition of Faraday's theory of induction see INDUCTION, ELECTROSTATIC.)

In order to compare the inductive capacities of various substances, Faraday made use of the fact that the capacity for electricity of a Leyden-jar depends on the inductive capacity of the insulator which separates the interior and exterior coatings. He constructed two spherical Leyden-jars precisely similar, so far as the conductors were concerned, but arranged so that the insulating medium might be varied. Having charged one of the jars he connected the other to it, the inside coatings together and likewise the outside coatings. Part of the electricity in the charged jar under these circumstances passes into the uncharged jar; and the jars being identical in form, it is divided between the two jars in proportion to the inductive capacities of their respective insulators. By determining the quantity in each jar the inductive capacities of the insulators are compared.

Faraday found that all the gases he experimented on have the same inductive capacity. He took common air as the standard of reference, and found the following numbers to represent the specific inductive capacities of the various substances compared with it:—

Air	1·00	Wax	1·86
Spermaceti	1·45	Glass	1·90
Resin	1·76	Shell-lac	2·00
Pitch	1·80	Sulphur	2·24

Later investigations on specific inductive capacity have been made with an arrangement called a platimeter, devised by Sir William Thomson (Lord Kelvin), and are far more accurate than any that could be made with Faraday's apparatus.

CAPE BRETON, an island of North America, belonging to Great Britain, situated in the Gulf of St. Lawrence, separated from Nova Scotia by the Gut or Strait of Canso, from 1½ mile to 1 mile wide. This island is about 110 miles in length, and from 20 to 84 in breadth, and is intersected by a great number of creeks and bays. The chief inlet, called the Bras d'Or, forms a sort of large lake, with many ramifications in the interior. A canal now forms an outlet from it on the south-east. The surface is rather rugged, and not very suitable for agriculture, but abounds in timber. In the valleys there is excellent pasture; and the coast abounds in fish. Coal-mining is carried on, and coal, timber, and fish are exported. The island was first colonized by the French, but was ceded to the British in 1763. It was a separate colony from 1784 to 1819, when it was incorporated into the province of Nova Scotia. It now sends eight members to its House of Assembly. The chief towns are Sydney and Arichat. Pop. (1891), 86,854; (1901), 97,190.

CAPE COAST CASTLE, a town and fort of Western Africa, on the Gulf of Guinea, in the British colony of the Gold Coast; lat. (light on fort) 5° 5′ 24″ N.; lon. 1° 13′ 38″ W. The fortress, which is large and well built, stands on a rock close to the sea, and projects in bold relief from the surrounding dark green forests. With exception of a few houses for Europeans, the town consists of straggling lines of mud huts, with clusters of palm-trees and an occasional tamarind attached. It is a principal mart for native trade. It is connected by telegraph with Accra (the capital), and by road with Prahsue. Climate unhealthy; mean temperature, 78°. The principal exports are gold-dust, ivory, and palm-oil. It was taken possession of by the British government in 1843. Pop. (1891), 11,614.

CAPE COD, a noted cape and peninsula on the coast of Massachusetts, on the S. side of Massachusetts Bay; lat. of the cape, 42° 5′ N.; lon. 70° 14′ W. The peninsula is 65 miles in length and from 1 to 20 in breadth, and is in the form of a man's arm, bent inward both at the elbow and the wrist. Though mostly sandy and barren, it is nevertheless populous; and the inhabitants derive their subsistence chiefly from the sea. The cape was discovered in 1602 by Bartholomew Gosnold, who gave it its name from having taken a great quantity of cod-fish near it.

CAPE COLONY, a British colony at the southern extremity of Africa, washed on the west, south, and east by the ocean, and having on the north and north-east the German territory of Great Namaqualand, the British territory of Bechuanaland, the Orange River Colony, Basutoland (British), and the colony of Natal. A considerable portion of the boundary on the north is formed by the Orange River. The colony extends about 450 miles from north to south and 600 from east to west; the coast line is about 1300 miles. The area is 276,000 square miles; the pop. (1891), 1,676,000. The principal bays are St. Helena, Saldanha, Table, False, Walker, Mossel, Plettenberg, St. Francis, and Algoa Bays. In the interior almost every variety of soil and surface is found, but a great part of the colony is arid and uninviting in appearance. Several ranges of mountains, running nearly parallel to the southern coast, divide the country into successive terraces, rising as they recede into the interior, between which lie belts of fertile land, or vast treeless and barren-looking plains. One of these, called the Great Karoo, is 300 miles long and 100 broad, and presents a desolate appearance, having a dry and often baked soil, with small shrubby plants scattered over it. Yet these plains make valuable sheep-walks, the flocks thriving exceedingly well upon the scanty vegetation; and the soil, where water can be obtained by collecting the rain, is generally very fertile. Large reservoirs have been constructed in many places, and permanent homesteads established where formerly flocks could only be maintained for a month or six weeks at a time. The principal and furthest inland mountain terrace averages 6000 or 7000 feet in height, and commencing in Namaqualand, runs eastward under the names of Roggeveld, Nieuwveld, Sneeuwbergen, Stormbergen, &c., to the north-east frontier. The culminating point is the Compass Berg, over 8000 feet high. The Table Mountain at Cape Town is a stupendous mass of naked rock, rising almost perpendicularly, about 3585 feet in height. The colony is deficient in rivers, though in this respect the eastern half is more favoured than the western. The Orange River is the largest in this part of Africa, but is of little or no use for navigation. Others are the Elephants or Olifants River, flowing into the Atlantic; the Gauritz, Gamtoos, Great Fish, Sunday, and Great Kei, emptying themselves into the sea on the S. and S.E. The climate is very healthy and generally pleasant, though in summer the heat is pretty great in some parts. The mean temperature for the year at Cape Town is about 62°. The climate of the dry and elevated inland districts is considered remarkably suitable for persons with weak chests or of consumptive tendency, and many have been attracted to the colony on this account.

Except along the coast line, especially the south-east coast district, where there are extensive forests, timber is scarce. There are upwards of a hundred different kinds of woods, however; many of them extensively employed for such purposes as house-building, wagon-making, furniture and cabinet work. With irrigation trees can be grown anywhere. The aloe and the myrtle grow to a great size. The quadrupeds of the colony comprise the African elephant, still found in the forests of the south coast region; the buffalo, equally restricted in locality; the leopard, jackal, hyæna, numerous antelopes, baboon, aardvark, &c. Lions, at one time numerous, are not now to be met with in the colony, nor is the giraffe. The birds include vultures, eagles, and other rapacious birds, the most remarkable of which is the serpent-eater, pelicans, flamingoes, and most important of all, the ostrich, now bred as a domestic animal for the sake of its feathers, the feathers plucked from an adult bird in a season being sometimes worth £10 to £18. Other native animals are large snakes, the venomous cobra de capello, and the scorpion. Along the coast whales and seals abound, and salt and fresh water fish are plentiful. The most valuable mineral product is diamonds; copper ore is largely exported; coal is mined, and iron ore, gold, amethysts, agates, &c., are found.

In regard to the diamond industry, which is of quite recent origin, some particulars must be given. The bulk of the diamonds that come into the market of the world in the rough state are now obtained from the Cape Colony. The great mining centre is Kimberley, in the far north of the colony, about ten miles from the Vaal River, and near the frontier of the Orange River Colony. So far as is known the first of the South African diamonds was casually picked up in 1867, and soon after several others were found, including a fine large stone known as the 'Star of South Africa'. By the early part of 1870 so many diamonds had been got that a rush of people to the diamond district began to take place, and the banks of the Vaal were soon covered with thousands of diggers. At first the precious stones were found on or near the surface, but subsequently it was discovered that they were to be found deeper down, and latterly they have been obtained many hundreds of feet below the surface, great open excavations having been made at the localities where they are plentiful. The richest mine has been the Kimberley Mine, situated in the centre of the town of same name, which sprung up around it. For the first hundred feet in depth the diamonds were found embedded in a soft friable yellowish earth; below that the soil changed to a slaty-blue colour, and was of a firmer consistency, and the diggers then thought that the bottom of the mine had been reached. It was soon discovered, however, that the blue ground yielded as many diamonds as the yellow, if not more, and this productivity has still continued. Another famous mine is the De Beer's Mine. Both these mines have yielded a remarkable number of large stones, but a great many of the diamonds have been 'off-coloured', that is, yellow, spotted, or otherwise defective in water or lustre. One of the finest yet found in S. Africa is the 'Porter Rhodes', a beautiful stone weighing 150 carats, and valued at £60,000. One much larger, a yellow stone, weighing 302 carats, was found in 1884, and a still larger was found in De Beer's Mine in 1888, weighing 428½ carats. The largest in the world, weighing 971 carats, but with a large flaw, was found in the Orange Free State in 1893. Although mining operations have been carried on at great expense, owing to the depths to which the workings have been sunk (some, 600 feet or more), the profits of the companies which latterly have owned the mines have been something enormous. The rough work has been done almost entirely by the native Africans, of whom ten or eleven thousand have been in employment in the mines at one time. Very stringent regulations have had to be enforced to prevent theft of the precious stones, and also illicit dealing in stones unlawfully acquired.

The colony is better adapted for pasturage than for agriculture, but wheat, maize, and other cereals can be grown almost everywhere, the only drawback to their cultivation being the want of moisture in certain localities and in certain seasons. In some years a surplus of grain is left for exportation; in others grain has to be imported. All kinds of European vegetables and pot-herbs, and all the fruits of temperate climates, such as apples, pears, plums, peaches, melons, apricots, walnuts, almonds, oranges, limes, &c., thrive excellently, and fruits, dried and preserved, are exported. The vine is cultivated, and some excellent wines (notably those of Constantia) are made. The colony is said to be particularly well-suited for grape culture, and the vines produce heavier crops than are known almost anywhere else. Viticulture it is believed is yet only in its infancy, though there are already over 90,000,000 vine-stocks. The colonial government has up to 1899 disposed of 128,000,000 acres of land, the quantity remaining undisposed of being 49,564,000 acres. Sheep-rearing is the most important industry, and wool the chief export (although surpassed in value by diamonds). The amount of this article exported to the United Kingdom in 1899 was 84,032,536 lbs. Most attention is now devoted to the breeding of pure merinoes, the consequence being a great improvement in the wool. Goats are also bred, both the native and the Angora, and the export of goats' wool or hair to Britain has increased from 102,570 lbs. in 1868, to 12,948,574 lbs. in 1899. Cattle-breeding is carried on to some extent, especially along the coasts and in the eastern and northern districts. There are no manufactures of any importance, and consequently the imports of the colony consist largely of manufactured goods, chiefly from Britain. The total imports in 1898-99 were of the value of £17,248,000; in 1882 they were £9,372,019, while in 1871 their value was £3,107,838; the exports in 1898-99 amounted to £27,065,000, in 1871 to £3,585,996. The value of the gold exported in the year 1898-99 was £17,265,000; of diamonds, including those sent through the post-office, £4,566,000. The total value of the diamonds exported from 1867 to 1898 was £88,000,000. The other exports of importance, besides wool, are ostrich feathers, copper ore, skins and hides. The exports of merchandise to Great Britain in 1899 amounted to £9,335,028, the imports of British produce to £8,380,547. To facilitate the inland traffic numerous roads have been made (the total length within the colony proper amounting to 8000 miles), while 2700 miles of railway and 7500 miles of telegraph have been opened. Lighthouses have been built round the coast, and harbour works constructed.

The European inhabitants consist in part of English, Scottish, and Irish settlers and their descendants, but the majority are of Dutch origin (see BOERS), while there are also a considerable number of German origin. The coloured people are chiefly Hottentots, Caffres, Bechuanas, Basutos, Griquas, Malays, and a mixed race, the offspring of black women and white fathers. The labourers are chiefly Hottentots and Caffres. The prejudices and ill-feeling once subsisting between the different nationalities of which the population is made up are now fast disappearing. Education is advancing, though it is not compulsory. The returns show a steady increase in the numbers of children of all classes receiving instruction. For the higher education there are seven colleges, besides a university (at Cape Town) incorporated in 1873. The colleges have each a staff of instructors in classics, mathematics, science, &c., but the university is merely an examining and degree-conferring institution. The religious bodies in the colony with the greatest number of adherents are the Dutch Reformed Church, the Church of England, the Methodists, Independents, and Presbyterians, in the order here given. There is no Established Church. The constitution formed under the acts passed in the years 1853, 1865, and 1872 rests the executive in the governor (who is also commander-in-chief of the forces) and an executive council or ministry composed of certain office-holders appointed by the crown. The legislative power is in the hands of a legislative council of twenty-three members, elected for seven years, over which the chief-justice presides *ex officio*, and a house of assembly of ninety-five members, elected for five years, representing the country districts and towns of the colony. The public revenue for 1897-98 was £7,212,225; the expenditure, £8,431,398; the public debt amounts to about £30,000,000. The revenue is chiefly derived from railways, customs duties, and taxes. Much the greater portion of the debt represents money spent on the construction of railways. The coinage of the colony is the British, as are also the weights and measures, except that for land the *morgen* = 2·116 acres is employed. After Cape Town the chief towns are Port Elizabeth, Kimberley, and Graham's Town.

The Dutch, who had early fixed upon the Cape as a watering-place for their ships, first colonized it under Van Riebeek, in 1652. Reducing the Hottentot inhabitants to slavery, or driving them beyond the mountains, they extended the Cape settlement over a pretty large area. But the colony was under the rule of the Dutch East India Company, and owing to their regulations made very slow progress. It was captured by the British in 1795, restored at the Peace of Amiens (1802), and again taken in 1806, Sir David Baird being sent at the head of an expedition to take possession of it, and so prevent it from falling into the hands of the French. From this time it has remained in the possession of Britain, to which it was formally assigned in 1815, along with Dutch Guiana, Holland receiving in return £6,000,000. It now began to advance in prosperity, but the progress of the colony was greatly retarded by the Caffre wars of 1834, 1846, and 1851–53, the result of the depredations of this warlike race. Subsequently the area of the colony was gradually enlarged by the annexation of surrounding districts. The most important of these annexations were British Caffraria (annexed 1866); Griqualand West (1876); Caffraria proper or the Transkeian districts (Transkei proper, Griqualand East, and Tembuland), including nearly the whole of the region between the Kei and the Natal Border (1875–80); Pondoland (1894); and part of Bechuanaland (1895). A most important event in the history of the colony was the discovery of diamonds. Its most recent history has been connected with the war between Britain and the Boer republics. See South African War, Boers.

CAPE HAYTIEN, a seaport town of Hayti, situated on the N. coast, with one of the most secure and convenient harbours in the island. Pop. about 15,000.

CAPE HORN, the southern extremity of an island of the same name, forming the most southerly point of South America. It is a precipitous headland, 500 to 600 feet high, and running far into the sea. Sailing vessels often encounter dangerous tempests in passing round the Horn; steamers generally pass through the Straits of Magellan. The cape was first doubled in 1616 by the navigator Schouten, a native of Hoorn, in Holland, whence its name.

CAPE OF GOOD HOPE, a celebrated promontory near the southern extremity of Africa, the termination of a small peninsula extending south from Table Mountain, which overlooks Cape Town. This peninsula forms the west side of False Bay, in which is safe anchorage for ships. Bartholomew Diaz discovered it in 1487, and called it Cape of Storms; but John II. changed the name to Cape of Good Hope. It was first doubled by Vasco de Gama, in 1497.

CAPER. Capers are the unopened flower-buds of a low shrub (*Capparis spinosa*) which grows from the crevices of rocks and walls, and among rubbish, in the southern parts of France, in Italy, and the Levant. The stems of the caper-bush are trailing, and 2 or 3 feet long. In the S. of France the caper-bush is very common. It grows wild upon the walls of Rome, Sienna, and Florence, and, when trained against a wall, flourishes even in the neighbourhood of Paris. It was introduced into Great Britain as an exotic so early as 1596. Modern horticulturists are of opinion that, with care, it might be raised in the open air in England, but this has never been accomplished to any practical extent. It is cultivated on a large scale between Marseilles and Toulon, and in many parts of Italy. In the early part of summer it begins to flower, and the flowers continue successively to appear until the commencement of winter. The buds are picked every morning, before the petals are expanded; and as they are gathered they are put into vinegar and salt. When a sufficient quantity is collected they are distributed, according to their size, into different vessels, again put into vinegar, and then packed up for sale and exportation. The smallest capers are the dearest, simply from the reason that they are more troublesome to gather. This pickle is much used in sauce for boiled mutton. To persons unaccustomed to it the taste of capers is unpleasantly sharp and bitter, but after a little while the palate becomes reconciled to it. The flower-buds of the marsh-marigold (*Caltha palustris*) and nasturtiums are frequently pickled and eaten as a substitute for capers. The bark of the root of the caper, cut into slices and dried in small rolls or quills, is sometimes used in medicine as a diuretic and in cases of obstruction of the liver.

CAPERCAILZIE, or Cock of the Wood (*Tetrao urogallus*), the largest species of grouse, about 2 feet 10 inches in length, and weighing from 9 to 12 lbs. In the male the elongated feathers of the throat are black, the rest of the neck and head ashy black, the eyebrows red, the iris clear brown, and the bill nearly 3 inches long, very strong, hooked, and of a whitish horn colour. The wings and shoulders are brown, sprinkled with small black dots, the breast variable green, the belly black with white spots, the rump and flanks black with zigzag lines of an ashy colour, and the tail feathers black, with some small white spots near their extremities. The female, about one-third less than the male, is striped and spotted with red or bay, black and white, and has the feathers of the head ruddy, those of the breast deep red, and those of the tail ruddy with black stripes. The nest is built on the ground, and contains from six to ten eggs of a reddish or yellowish brown; when hatched the young are fed upon insects. The old birds feed chiefly on vegetable substances, such as juniper and bilberries, and the leaves and buds of several trees. It abounds in the N. of Asia, and is common in parts of Russia and throughout Scandinavia. It is also not unfrequent in parts of Germany, and is found, though rarely, in Italy, France, and parts of the Alps. It was once common in the British islands, but latterly became extinct as a wild species. Recently it has been again introduced into the forests of the Highlands, though it forms a too large, too easy, and too tempting mark for the sportsman to be permitted to multiply. It breeds in confinement, and seems capable of being domesticated. It is excellent eating; and from the easy means of communication by steam with the north of Europe is now often seen in British shops. See illustration at Ornithology.

CAPERNAUM, a town in ancient Palestine, on the W. or N.W. side of the Sea of Tiberias. This place is famous in Christian history, because Jesus often visited it during the time of his ministry, and in its vicinity he delivered the sermon on the mount. Nothing of it now remains.

CAPE ST. VINCENT, the S.W. point of Portugal; lon. 8° 58′ W.; lat. 37° 3′ N. Noted for the naval victory gained off it over a powerful Spanish fleet by Sir John Jervis (afterwards Earl of St. Vincent) on the 14th of February, 1797.

CAPET, the name of the French race of kings, which has given 118 sovereigns to Europe, viz. 36 kings of France, 22 kings of Portugal, 11 of Naples and Sicily, 5 of Spain, 3 of Hungary, 3 emperors of Constantinople, 3 kings of Navarre, 17 dukes of Burgundy, 12 dukes of Brittany, 2 dukes of Lorraine, and 4 dukes of Parma. The history of this royal race is, at the same time, the history of the rise and progress of the French monarchy. (See France.) The fate of one of the most interesting countries and nations in Europe is connected with the name of Capet. After having been deprived of four thrones, and again restored to them, this family stood forth as the first and most ancient support of the European principle of political legitimacy, that divine right, which in this house commenced with treason. Its origin is remarkable. Pepin the Short, the father of Charlemagne and mayor of the palace under the Merovingian dynasty, had displaced that royal house, and usurped the throne of the ancient kings of the Franks. After a space of 235 years his own descendants, the Carlovingian monarchs, experienced a similar fate. Under the last Carlovingians, destitute alike of energy and wisdom, Hugh the Great, duke of France (by which was then understood the Isle of France), Orleans, and Burgundy, exercised a power as unlimited as that of the mayor of the palace under the Merovingians. On the death of Louis V., without children, in 987, his uncle Charles, duke of Lower Lorraine, laid claim to the throne, which the Franks had sworn to preserve to the family of Charlemagne. The French nobility, disgusted at the German leanings of the Carlovingians, whose domains and influence lay in the eastern provinces, preferred that a member of their own class, whose possessions were situated in the centre of the country, and whose power was so great as to outrival that of the old dynasty, should rule over them, and accordingly chose as their king Hugh, son of Hugh the Great, duke of France and count of Paris, and had the support of the church in their favour. The valiant Charles of Lorraine was surprised in Laon by the treachery of a bishop, and made prisoner. He died soon afterwards in prison, and his son Otho, duke of Lower Lorraine, died in 1006. Both his younger brothers died childless in Germany. Thus the race of Capet was left in possession of the throne of France. According to some historians, Hugh Capet was descended from a Saxon family. He was married to a German princess, Adelaide, daughter of King Henry I. of Germany (duke of Saxony). Hugh was crowned at Rheims, and swore to preserve to the nation, and particularly to the powerful feudal nobility and clergy, all their existing privileges. By his wise measures he gave permanence to his dynasty, which, next to the family of Guelph, is the oldest royal line at present existing. (See BOURBON.) Hugh and the succeeding monarchs, till Louis VII., took the precaution to have their sucessors invested with the royal title during their own lifetime. Thus Hugh had his son Robert crowned and anointed, as his colleague, as early as Jan. 1, 988. He abolished by law the partition of the hereditary estates among the sons of the kings and forbade the alienation of the family domains. The daughters of the kings were endowed from that time with money, and the appanage which was given to the princes of the blood returned to the crown in default of male heirs. Both these principles where more fully confirmed by later laws. Thus Hugh Capet, by uniting his hereditary duchy, consisting of Paris, Isle de France, and Burgundy, inalienably with the crown, may be regarded as the founder of the French monarchy. What he had begun was completed by his successors, particularly in the times of the Crusades, and by the establishment of standing armies.

CAPE TOWN, capital of the Cape Colony, situated in the midst of striking scenery, rather more than 30 miles from the Cape of Good Hope, at the head of Table Bay, which opens into the Atlantic on the north-west, and at the foot of Table Mountain. It is regularly laid out and has some good streets, with well-built business premises and other buildings, and is furnished with most of the institutions and conveniences of a European town (including tramways). The finest edifice is that which accommodates the legislature, a handsome structure of recent erection; another good edifice is that containing the public library (40,000 vols.) and museum, in the Roman-Corinthian style. The Standard Bank of S. Africa also occupies handsome premises. Other buildings are the government-house, the courts and government offices, the town-house, the gallery of fine arts, the railway-station, the post-office, the exchange, &c. The best ecclesiastical building is the Roman Catholic cathedral; there is also an English Episcopal cathedral, and Dutch, Presbyterian, Lutheran, Independent, and Methodist churches. There is a well-equipped college, the South African College, which trains students for the degrees of the Cape University, which is merely an examining body. There are beautiful botanic or government gardens in the town, occupying 14 acres, and forming a fine promenade. The Cape Observatory is a celebrated institution supported by imperial funds. A railway runs from Cape Town into the interior of the colony, connecting the town with the Orange Free State and Transvaal. The port has been provided with a breakwater 3554 feet long, inside of which ships can safely ride at anchor protected from the north-west gales; and there are two docks 16 acres in area, an outer harbour of 62 acres, a large graving-dock, &c. Pop. in 1875, with suburbs, 45,000; in 1891, 51,083; with closely adjoining suburbs, 59,680. The population is very mixed, a large number consisting of coloured people of negro or other African descent. About 14,000 are Malays, descendants of those who were brought from the Dutch East Indies. They constitute the chief fishing and working population of the town and environs.

CAPE VERD, the extreme west point of Africa, between the Senegal and the Gambia. Fernandez, the Portuguese navigator, discovered it in 1445.

CAPE VERD ISLANDS, islands of Africa, in the Atlantic; so called from Cape Verd, opposite to which they are situated; 320 miles W. Cape Verd, and between 15° and 18° N. lat. They belong to Portugal. As to their number, some reckon ten, others fourteen or more, by giving the name of islands to those which are only rocks. They are, in general mountainous. The island of Fogo, one of the group, consists of one single mountain, a volcano, sometimes active, about 10,000 feet above the level of the sea. Some of the islands are very bare; in others the lower hills are covered with a beautiful verdure, as well as the valleys between; but there is little water, except what is found in ponds and wells. Long droughts have sometimes occurred, even so as to cause great loss of life. The climate is hot and unhealthy in most of the islands. The soil is, for the most part, not very fertile; nevertheless, some parts produce sugar, coffee, rice, maize, &c., with bananas, lemons, oranges, citrons, grapes, and other fruits. The total pop. amounts to about 110,000, of whom about 7000 are of Portuguese blood, the rest being chiefly negroes. The chief town is Porto Praya on São Thiago (Santiago), and Porto Grande on São Vicente is a coaling station for steamers. Salt is an export of importance. Coffee, hides, and physic-nuts are also exported.

CAPE WRATH, the north-western extremity of Scotland, in the county of Sutherland. It is a pyramid of gneiss rising to a height of 300 feet, on which is a lighthouse bearing a revolving light 400 feet above sea-level, showing a white and red light alternately, which can be seen 27 miles off; lat. 58° 38′ N.; lon. 4° 50′ W.

CAPIAS. A writ or process of capias is one whereby the sheriff is ordered to arrest the body of the defendant, either before judgment, to compel him to answer to a suit; and this was called a *capias ad respondendum;* or after the judgment, to compel him to satisfy the judgment; and this is called a *capias ad satisfaciendum*, commonly abbreviated *ca. sa.* In case of injuries without force, the civil law, and originally the common law, did not authorize the arrest of the defendant before judgment, that is, the arrest *to* *answer*; and upon feudal principles, says Sir William Blackstone (3 Com. 281), "the person of a feudatory was not liable to be attached for injuries merely civil, lest thereby the lord should be deprived of his services". The first writ of *capias ad respondendum* was given by act of Parliament in 1267, 52 Henry III. cap. xxiii. sec. 1, which provided that, "if bailiffs, which ought to make account to their lords, do withdraw themselves, and have no lands nor tenements whereby they may be distrained, they shall be attached by their bodies, so that the sheriff shall cause them to come to make their account". This act applied to a particular description of receivers, and supposed them not only to be debtors, but also to have in their own hands the evidence of the amount of the debt, the production of which was one object of the process. The statute of 13 Edward I. cap. xi., passed in 1285, eighteen years after the former, extends this process to "all manner of receivers bound to yield account", and provides "if they be found in arrearages upon this account, their bodies shall be arrested, and by the testimony of the auditors, shall be sent into the next jail, and be imprisoned in irons under safe custody, and remain in prison at their own cost until they have satisfied their master [the creditor] fully of their arrearages". It would appear that the practice of arresting on mesne process, that is before judgment, *to answer* in civil suits, grew out of these statutes; for the subsequent statutes of 25 Edward III. cap. xvii. (A.D. 1350), providing that "such process shall be made in writ of debt, detinue of chattels, and taking of beasts, by writ of capias, as is used in writ of account"; and of 21 Henry VII. cap. ix. (A.D. 1503); evidently have reference to an arrest *to answer*. Formerly, a writ upon which a suit was commenced was either a capias, distress, or summons; either the person of the defendant was seized, and (unless he was bailed) imprisoned until the trial, or his goods or lands were seized as a guarantee of his appearance to answer; and more often, in modern times, to obtain a lien to secure satisfaction of the judgment; or he was only summoned, that is, merely had notice that a suit had been commenced before such a court, by such a plaintiff, and was to be heard at such a time. The commencement of an action by summons is now the usual course of procedure, recent legislation, and especially the practical abolition of imprisonment for debt, having greatly restricted the use of writs of capias of any kind. By the Debtors' Act, 1869 (32 and 33 Vict. cap. lxii.), the writ of *capias ad satisfaciendum* is abolished, unless in cases in which the defendant can pay but will not. The same act provides that when a plaintiff has good cause of action against a defendant to the amount of £50 or upwards, and the defendant is about to quit England, and the absence of the defendant from England will materially prejudice the plaintiff in the prosecution of his action, a judge may order the defendant to be arrested, unless, or until, security be found.

CAPILLARITY, in physics, the rise of a liquid in tubes of very fine diameter to a greater height than the surface of the fluid in which such tubes are immersed; together with certain kindred phenomena. If one end of a tube of this sort, open at both ends, be immersed in a fluid which adheres to glass, as water, the liquor within the tube will rise to a sensible height above the surface of that without. This phenomenon is explained by the attraction which exists between the glass and the fluid. Such liquids as do not adhere to glass (for example, quicksilver) do not rise in the tube; on the contrary, they stand lower within than without it. The mutual action of the elementary particles of matter, of which capillarity is a noted instance, gives rise to phenomena as interesting, and in certain cases as susceptible of being attached to theory by rigorous mathematical reasoning, as the phenomena of universal gravitation. The ascent of liquids in capillary tubes engaged much of the attention of experimental philosophers in the eighteenth century. Hauksbee found that the ascent of the liquid does not depend in any way on the thickness of the tube, and that when two plates, forming any small angle with each other, are plunged vertically into a fluid, the fluid which rises between them takes the form of an equilateral hyperbola; from which it followed that, in tubes of the same matter, the ascent of the liquid follows the inverse ratio of their interior diameters. In order to explain these facts succeeding physicists seem to have agreed in assuming the existence of a cohesive force among the particles of the liquid, and an adhesive force between the particles of the liquid and those of the tube. But these attractive forces can only be defined by their relative intensities at an equal distance, and the law according to which they diminish as the distance is increased. Now there are no data from which either their relative intensities or the law of their variation can be determined; we are, therefore, reduced to choose among a number of hypothetical laws, all equally possible; and the explanation, of course, depends on the particular hypothesis we adopt; hence the theories of Clairaut, Young, Laplace, and Poisson.

Clairaut was the first who attempted to reduce the phenomena of capillarity to the laws of the equilibrium of fluids, and exactly analysed all the forces that concur to elevate the liquid in a glass tube. He showed that the portion of the liquid which is elevated in the tube above the exterior level is kept in equilibrium by the action of two forces, one of which is due to the attraction of the meniscus terminating the column, and the other to the direct attraction of the tube on the molecules of the liquid. Clairaut, however, regarded this last force as the principal one, and even supposed the attraction of the tube to extend as far as its axis; but this supposition is contrary to the nature of molecular forces, which extend only to insensible distances. The action of the tube has, in fact, no influence on the elevation or depression of the contained liquid, excepting in so far as it determines the angle under which the upper surface of the fluid intersects the sides of the tube. Neglecting, therefore, this force as insensible, there remains only the action of the meniscus to support the weight of the elevated column. But though Clairaut made an erroneous supposition respecting the nature of molecular action, and failed in the attempt to demonstrate from theory that the ascent of the liquid is inversely proportional to the diameter of the tube, he showed that a number of hypotheses regarding the law of attraction may be laid down, from any one of which that law of ascent may be deduced; and he demonstrated a very remarkable result, namely, that if the attraction of the matter of the tube on the fluid differs only by its intensity, or co-efficient, from the attraction of the fluid on itself, the fluid will rise above the surrounding level when the first of these intensities exceeds half the second.

Young referred the phenomena of cohesion to the joint operation of attractive and repulsive forces, which in the interior of fluids exactly balance each other, and assumed the repulsive force to increase in a higher ratio than the attractive when the mutual distances of the molecules are diminished. From these considerations he was led to discover a very important fact in the theory of capillary action, namely, the invariability of the angle which the surface of the fluid makes with the sides of the tube.

Laplace published his theory of capillary attraction in 1806 and 1807, in two supplements to the Mécanique Céleste. Assuming the force of molecular action to extend only to imperceptible distances, he demonstrated that the form of the surface of the liquid is a principal cause of the capillary phenomena, and not a secondary effect, and determined the part of the phenomena which is due to the cohesive attraction of the molecules of the fluid to each other, as well as that which results from their adhesion to the molecules of the tube. The separate consideration of the cohesive and adhesive forces leads to two equations, which comprehend the whole theory of capillarity—a general equation, common to all those points of the capillary surface of which the distance from the sides of the tube is greater than the radius of the sphere of molecular action; and a particular equation belonging to those points which are situated only at insensible distances from the surface of the tube, or are within the sphere of its action. This last equation will obviously express the angle which the surface of the meniscus makes with the sides of the tube; an angle which, as it depends only on the nature of the tube and that of the liquid, is constant and given in every case, the liquid and tube being supposed homogeneous. Laplace further supposes, in the case of elevation, that an infinitely thin film of the liquid first attaches itself to the sides of the tube, and thus forms an interior tube, which acts by its attraction alone to raise the column, and maintain it at a determinate height. The height of the column, consequently, depends on the cohesion and density of the liquid.

Poisson reinvestigated the whole theory of capillary attraction. Taking the most general case of the problem, he considers not merely the surface of a single liquid, but the surface formed by the contact of two liquids of different specific gravities, placed, the one above the other, in the same tube, and deduces the two equations which determine the form of the separating surface, and the angle under which it intersects the sides of the tube. These equations are in form the same as those of Laplace; but the definite integrals, which express the two constant quantities they include, are very different; and their numerical values would be so likewise, if these, instead of being determined experimentally, could be calculated *a priori* from the analytical expression. This, however, cannot be done without a knowledge of the law according to which the molecules of the liquid attract each other, as well as of that which regulates the action of the tube on the liquid. In applying his general solution to the explanation of the principal phenomena of capillarity, he took occasion to correct some inaccuracies of Laplace. The demonstration which Laplace had given of the invariability of the angle which the surface of the liquid makes with the sides of the tube was not altogether satisfactory; and he had even supposed that it changes its value when the liquid reaches the summit of the tube. Poisson demonstrated that the invariability of this angle will always be preserved, unless the curvature of the interior of the tube is infinitely great; or, in other words, unless its radius is infinitely small and of the same order of magnitude as the radius of the sphere of molecular action. Hence the angle cannot vary when the liquid reaches the summit of the tube; for, however small the radius of the tube may be, it is always incomparably greater than the radius of the sphere of molecular action.

The molecular forces which cause the elevation or depression of a fluid in fine tubes give rise also to numerous other interesting capillary phenomena. These are displayed at the surface of separation of two liquids, or of a liquid and a gas; sometimes even three fluids may be brought into simultaneous contact, and the phenomena then presented are very remarkable. In the midst of a liquid, the molecular attractions at any point being similar in all directions, and thus counterbalancing each other, may easily remain unnoticed. It is when an abrupt change produces want of symmetry in some direction that they become observable. They give rise, at the surface of separation of two fluids, to resultant forces that act just as would a stretched film containing the fluid; and the variations in these resultant forces causing a corresponding apparent variation in the contractile force of this imaginary film, occasion the phenomena we are about to describe.

The contractility of the film may be seen in the case of a little globule of mercury on a wooden table, or in the case of a soap-bubble. The mercury, instead of spreading itself out over the wood, as it might be expected to do on account of the weight of its parts, is gathered up into a little ball, just as if it were contained in an elastic bag. Again, if a soap-bubble be blown with an ordinary tobacco-pipe, it may be shown, by bringing the mouth-piece near to a lighted candle, that the soap-bubble contracts with force enough to send a strong current of air backwards through the stem.

The surface contractility is measured by the force required to draw out a band of it of unit breadth, or rather to prevent such a band from contracting. It has been ascertained that if we could cut out a band of the soap-and-water film an inch broad, a force of about 6 grains would be sufficient to hold it stretched. As there are *two* surfaces of the soap film, it follows that the superficial contractile force of soap and water exposed to air is about *3 grains per lineal inch.*

M. Quinke, experimenting on this subject, found that the superficial tension for water is greater than for any other liquid that he tried. He determined the superficial tension of various liquids in contact with air, water, and mercury.

When two liquids, whose superficial tensions in air are not the same, are put in contact, both being also in contact with air, curious effects ensue. Thus when a pure water surface is touched with a glass rod that has been wetted with any kind of oil, the surface tension at the point is reduced, and the oil, with very remarkable motions, spreads itself out on the surface of the water. The well-known motions of light particles of camphor thrown on water are accounted for in the same way. This may be beautifully shown by means of an experiment devised by Professor James Thomson of Glasgow, who first gave an explanation of the phenomenon known as the 'tears of strong wine'. Let a very well cleaned glass plate be laid on a sheet of white paper, and moistened all over with slightly-coloured water. Then let a few very small drops of alcohol or spirits be thrown on the plate. The water film will be seen to draw away on all sides from the points where the drops fall owing to the weakening of the superficial tension at these points. The 'tears of strong wine' are seen when wine, which contains water and alcohol, is allowed to evaporate in the air. The alcohol evaporates faster than the water, and as it does so the superficial tension increases. This occurs rapidly in the thin layer of wine that adheres to the sides of a wine-glass, and causes the film to be dragged from the places where the wine is strong to those where it is weak. Thus the film is seen to run up the sides of the glass, and then to collect into drops, which run down the side again.

Mr. Tomlinson made interesting researches on the 'cohesion figures of liquids', that is, the figures which various liquids, such as essential oils, take when drops of them are let fall on a very pure surface of water. He made them a means of detecting impurities in the essential oils. His researches will be found in the Philosophical Magazine.

CAPILLARY VESSELS, the minute vessels in which the arteries terminate, and from which, in a way not well understood, the veins commence. The distinction between the arteries and veins is, therefore, lost in these vessels. The support of the solid, and the formation of the fluid, parts of the system take place especially in these vessels.

CAPISTRANUS, JOHANNES, so called from Capistrano, a small Neapolitan town of the Abruzzi, where he was born in 1386. He at first studied law, but in his thirtieth year, impelled by a fancied vision, entered the Franciscan order, and was soon distinguished by the austerity of his manners, and a fiery zeal against the numerous sects in Italy. The Popes Martin V., Eugene IV., and Felix V., often employed him as legate and inquisitor in suppressing the sect of the Fraticelli, who had spread widely over Naples and the Papal States. In 1444 he became vicar-general of the strict order of Franciscans called Observants, and in 1450 proceeded as legate to Germany with a view to suppress the Hussites, and rouse the Germans to a crusade against the Turks. His harangues in favour of a crusade against the Turks failing to make much impression on the German princes he resolved to try their effect on the populace, and easily persuaded great numbers to join him in marching against the Turks, who were advancing under Mohammed II., and had closely invested Belgrade, the key of Hungary, with an army of 150,000 men. At the instigation of Capistranus John Corvinus Hunnyades furnished a force of 60,000, destroyed the Turkish fleet on the Danube, and threw into Belgrade succours both of men and provisions. On this expedition Capistranus in person commanded the left wing of the army, forced his way into Belgrade, repulsed a general assault by the Turks, and on the 6th August, 1456, in conjunction with Hunnyades, signally defeated the whole Turkish host. His exertions, and the pestilential atmosphere caused by the dead bodies lying unburied around Belgrade, laid him on a sick-bed, and he died in the same year in the Franciscan monastery at Illock.

CAPITAL, in political economy, is the stock of valuable exchangeable commodities possessed by individuals or a community. This is the usual and more limited meaning of the term; for, in comparing the capital of one individual with that of another, we have in mind the amount of money for which the stock of each can be exchanged. The market value is in view. In estimating the capital of any individual we necessarily take into consideration the debts due to and from him; and many men of large capital are only possessed of claims upon others; their whole stock is in the hands of others at interest; and they have only promises for a certain amount of money, and actually possess neither lands nor goods to any considerable value; while others possess large quantities of both, and yet have little or no capital, since they owe in money the value of the greater part or the whole of their possessions. Now it is plain that no individual can undertake production, to any large extent, without an extensive stock. He must have land to cultivate, or materials to work up, and implements to work with. Even a savage must have a capital, such as his hut, clothes, cooking utensils, food enough to support him until he can obtain a new supply, and implements, such as a hatchet, gun, canoe, fishing gear, to procure this supply. The first effort of industry is to supply the implements, apparatus, and machinery for his own employment; and as society and the arts advance, and the operations of industry are extended, the implements, apparatus, machinery, and materials requisite in conducting the processes of production must be proportionally accumulated; and these will constitute a part of the capital of a community, and also of an individual, which is essential to success in productive processes. And these can be commanded by any one in proportion to the extent of his individual capital; or, if he have credit, then his resources for production will depend upon the capital of others—in other words, that of the community to which he belongs.

In considering the aggregate capital of a community we may put out of the question all the debts due from any of the members to others; for, whether these be great or small,—and they will vary according as the practice of giving credit is more or less in use,—still the capital of the community will consist in its lands, buildings, ships, machinery, materials on hand, implements; in short, in all those things which bear a value in the market. Provided the community owes no debt abroad, these will constitute its aggregate capital; and, if its members are indebted abroad, we find its actual net capital, as in the case of an individual, by deducting the amount of its debts from the value of its possessions, without regarding the debts due from some of its members to others.

Capital is distinguished into *floating* or *movable*, and *fixed;* the former consisting of things that may be transferred by delivery of any kind from place to place, the latter of land, houses, and other property which must be taken delivery of in the place where they stand. Another use of the distinction is made to represent the difference between the permanent plant of a business and the current capital necessary to carry it on. Capital may thus be said to be fixed either when it is physically incapable of being moved, or when it is rendered immovable by the permanent arrangement of its owner. Thus one carrying on a flour-mill wants a floating or disposable capital, over and above the cost of his works to be invested in wheat to be floured, and flour not yet disposed of. This instance illustrates what is meant by the floating or disposable capital of a whole community being that movable exchangeable stock of things on hand, over and above the fixtures and apparatus of production, including lands, buildings, ships, working animals, all the implements of the arts, with necessary food, clothing, and a stock of seed sufficient for the time requisite for reproduction. What remains over these is the disposable capital, and, in a flourishing community, the disposable floating capital is constantly invested in new fixed capital, implements and apparatus of production. A declining community, on the contrary, consumes a part of its implements and apparatus of industry; or what is in effect the same thing, it does not repair and replace the damage of use and decay. The idea is held out in many economical treatises that a community cannot have a surplus capital; that is, it cannot have more capital than it can make use of in its consumption and reproduction. As no grounds whatever are given for this doctrine, it seems to be hardly entitled to a consideration; for the position is certainly, at the first view, very improbable, since we know very well that men may accumulate; and why they may not, in any possible case, accumulate a surplus, does not appear by any plausible reason, and whether such surplus accumulation may be useful or not will depend entirely upon the kind of articles of which such accumulation consists. If it consist in articles the value of which depends on the prices in foreign markets the excess may be of no value at all; for it may so depress the foreign prices as to countervail all the direct advantage arising from the cheaper supply, for a time, of the domestic demand.

Fictitious capital generally means nothing more nor less than excessive credits, which throw the management and disposition of a great deal of property into the hands of persons who are not able to answer for the risks of loss from its bad management, or other causes. A whole community, in the aggregate, can have fictitious capital only in case of its members having an excessive credit in a foreign country. But the members may, among themselves, have a fictitious capital by too great facility of credits in their dealings with each other, and the fiction, in this case, is in their false promises of payment.

CAPITAL, in geography, a city in which reside the highest authorities of a district, province, country, &c. It would be difficult to determine whether the good or evil consequences of large capitals in modern times are greater, and such an examination would far exceed our limits; otherwise it would be very easy to point out, in every department of civilization, in science, social intercourse, politics, arts, &c., both salutary and pernicious effects, resulting from the influence of capitals. It seems to us a matter of little doubt that it must be regarded as disadvantageous to any country if the capital by a disproportionate superiority destroys the importance of the rest of the country, as we find to be the case with Paris, which, as has been often observed, contains France. In Germany the state of things was long the reverse, there being no city which could boast of being the point of national concentration. The consequences have been very advantageous to science, and somewhat disadvantageous to literature. In politics this want of a central point has had melancholy consequences for Germany. London never exercised that degree of influence over England which Paris has over France; one reason of which may be that the two most extensive institutions for the diffusion of knowledge are not seated in the metropolis. The great increase of wealth and consequence which the capitals of large empires in Europe have acquired in modern times, by the introduction of the bureau system (which see), which has brought together in one place the different departments of administration, has had much influence on military operations, having made the capture of the capital now far more important than formerly.—In the United States the word *capital* is not used officially, but, instead of it, the phrase *seat of government*, which is, in most cases, not the largest place of the state. It is not here the place to discuss whether it would be more beneficial to the whole country if the seat of the general government were in one of the largest cities of the United States. As it is now, to use the words of a traveller, 'Washington must by no means be considered as the capital of the nation, but only as the capital of governmental business. It is a camp of business.'

CAPITAL, an architectural term derived from the Latin *caput*, and therefore capable of being applied in a general sense to the uppermost member of any part of a building, though usually restricted to the upper extremity of a column, the part resting immediately on the shaft. It is subjected to fixed rules, varying in its form, size, and ornaments, according to the order of architecture to which it belongs.

CAPITAL OFFENCE. See CRIME.

CAPITAL PUNISHMENT. The questions most commonly discussed by philosophers and jurists under this head are, 1, as to the right of governments to inflict the punishment of death; 2, as to the expediency of such punishment; 3, as to the crimes to which, if any, it may be most properly confined and limited; 4, as to the manner in which it should be inflicted. A few words will be said on each of these points.

1. As to the *right* of inflicting the punishment of death. This has been doubted by some distinguished persons; and the doubt is often the accompaniment of a highly cultivated mind, inclined to the indulgence of a romantic sensibility, and believing in human perfectibility. The right of society to punish offences against its safety and good order will scarcely be doubted by any considerate person. In a state of nature individuals have a right to guard themselves from injury, and to repel all aggressions by a force or precaution adequate to the object. This results from the right of self-preservation. If a person attempts to take away my life, I have, doubtless, a right to protect myself against the attempt by all reasonable means. If I cannot secure myself but by taking the life of the assailant, I have a right to take it. It would otherwise follow that I must submit to a wrong, and lose my life rather than preserve it by the means adequate to maintain it. It cannot, then, be denied, that in a state of nature men may repel force by force, and may even justly take away life if necessary, to preserve their own. When men enter society, the right to protect themselves from injury and to redress wrongs is transferred generally from the individuals to the community. We say that it is generally so, because it must be obvious that in many cases the natural right of self-defence must remain. If a robber attacks one on the highway, or attempts to murder him, it is clear that he has a right to repel the assault, and to take the life of the assailant, if necessary for his safety; since society in such a case could not afford him any adequate and prompt redress. The necessity of instant relief, and of instant application of force, justifies the act, and is recognized in all civilized communities. When the right of society is once admitted to punish for offences, it seems difficult to assign any limits to the exercise of that right, short of what the exigencies of society require. If a state have a right to protect itself and its citizens in the enjoyment of its privileges and its peace, it must have a right to apply means adequate to this object. The object of human punishments is, or may be, threefold; first, to reform the offender; secondly, to deter others from offending; and lastly, to secure the safety of the community, by depriving the offender of the power of doing mischief. The first consideration rarely enters into human legislation, because of the inadequacy of our means to produce great moral results by the infliction of punishment. The two latter considerations enter largely into the theory and practice of legislation. Who is to be the judge in such cases? what is the adequate punishment for any offence? Certainly, punishments ought not to be inflicted which are utterly disproportionate to the offence, and beyond the exigencies of society. No government has a right to punish cruelly and wantonly, and from mere revenge; but still, the discretion must be vested somewhere, to say what shall be the degree of punishment to be assigned to a particular offence. That discretion must be, from its nature, justly a part of the legislative power, and to be exercised according to the actual state of society. It may, nay, it must be differently exercised in different ages and in different countries; for the same punishment which in one age or country may be sufficient to suppress an offence, or render it comparatively harmless, may, in another age or country, wholly fail of the effect. If mild punishments fail of effect, more severe must be resorted to, if the offence be of a nature which affects society in its vital principles, or safety, or interests. The very frequency of a crime must often furnish a very strong ground for severe punishment, not only as it furnishes proof that the present punishment is insufficient to deter men from committing it, but from the increased necessity of protecting society against dangerous crimes. But it is often said that life is

the gift of God, and therefore it cannot justly be taken away, either by the party himself or another. If he cannot take it away, he cannot confer that power on others. But the fallacy of this argument is obvious. Life is no more the gift of God than other personal endowments or rights. A man has, by the gift of God, a right to personal liberty and locomotion, as well as to life; to eat and drink and breathe at large, as well as to exist, yet no one doubts that, by way of punishment, he may be confined in a solitary cell; that he may be perpetually imprisoned or deprived of free air, or compelled to live on bread and water. In short, no one doubts that he may be restrained in the exercise of any privileges or natural rights short of taking his life. Yet the reasoning, if worth anything, extends to all these cases in an equal degree. If, by his crimes, a man may justly forfeit his personal rights, why not his life? But we have seen that it is not true, even in a state of nature, that a man's life may not be taken away by another, if the necessity of the case requires it. Why then may not society do the same, if its own safety requires it? Is the safety of one person more important than the safety of the whole community? Then, again, as to a man's inability to confer on others a right which he does not himself possess. Suppose it is so; the consequence which is deduced from this does not, in fact, arise. Blackstone, indeed, in his Commentaries (4 Comment. 8), seems to deduce the right of society to punish capital offences, in certain cases (that is, in cases of *mala prohibita* and not *mala in se*), from the consent of the offenders. The Marquis Beccaria, on the other hand, denies that any such consent can confer the right, and therefore objects to its existence. But the notion of consent is, in nearly all cases, a mere theory, having no foundation in fact. If a foreigner comes into a country and commits a crime at his first entrance, it is a very forced construction to say that he consents to be bound by its laws. If a pirate commits piracy, it is absurd to say that he consents to the right of all nations to punish him for it. The true and rational ground on which the right rests is not the consent of the offender, but the right of every society to protect its own peace, and interests, and property, and institutions, and the utter want of any right in other persons to disturb, or destroy, or subtract them. The right flows, not from consent, but from the legitimate institution of society. If men have a right to form a society for mutual benefit and security, they have a right to punish other persons who would overthrow it. There are many cases where a state authorizes life to be taken away, the lawfulness of which is not doubted. No reasonable man doubts the right of a nation, in a just war, especially of self-defence, to repel force by force, and to take away the lives of its enemies. And this right is not confined to repelling present force, but it extends to precautionary measures, which are necessary for the ultimate safety of the nation. In such a war a nation may justly insist upon the sacrifice of the lives of its own citizens, however innocent, for the purpose of ensuring its own safety. Accordingly, we find that all nations enrol militia and employ troops for war, and require them to hazard their lives for the preservation of the state. In these cases life is freely sacrificed by the nation; and the laws enacted for such purposes are deemed just exercises of power. If so, why may not life be taken away by way of punishment if the safety of society requires it? If a nation may authorize, in war, the destruction of thousands, why may it not authorize the destruction of a single life, if self-preservation require it? The mistake, however, is in supposing that life cannot be taken away without the consent of the party. If the foregoing reasoning be correct, such consent is neither supposed nor necessary. In truth, the supposition of an original compact between all the persons who are subject to the regulations of a society, by their own free consent, as the necessary and proper basis on which all the rights of such society depend is at best a gratuitous supposition; and it sometimes leads to very incorrect results. It may be added that the Scriptures most clearly recognize and justify the infliction of capital punishments in certain cases.

2. As to the *expediency* of capital punishment. This opens a wide field for discussion. Some able men who do not doubt the right, do still deny the expediency of inflicting it. It may be admitted that a wise legislature ought to be slow in affixing such a punishment to any but very enormous and dangerous crimes. The frequency of a crime is not of itself a sufficient reason for resorting to such a punishment. It should be a crime of great atrocity and danger to society, and which cannot otherwise be effectually guarded against. In affixing punishments to any offence, we should consider what are the objects and ends of punishment. It is clear that capital punishment can have no effect in reforming the offender himself. It may have, and ordinarily does have, the effect of deterring others from committing a like offence; but still, human experience shows that even this punishment, when inflicted for small offences, which are easily perpetrated, and to which there is great temptation, does not always operate as an effectual terror. Men sometimes are hardened by the frequent spectacles of capital punishments, and grow indifferent to them. Familiarity deprives them of their horror. The bloodiest codes are not those which have most effectually suppressed offences. Besides, public opinion has great weight in producing the acquittal or condemnation of offenders. If a punishment be grossly disproportionate to the offence, if it shock human feelings, there arises, insensibly, a sympathy for the victim, and a desire to screen him from punishment; so that, as far as certainty of punishment operates to deter from crimes, the object of the legislature is often thus defeated. It may be added that a reasonable doubt may fairly be entertained whether any society can lawfully exercise the power of punishing beyond what the just exigencies of that society require. On the other hand, a total abolition of capital punishments would, in some cases at least, expose society to the risk of deep and vital injuries. A man who has committed murder deliberately has proved himself unfit for society, and regardless of all the duties which belong to it. The safety of society is most effectually guarded by cutting him off from the power of doing further mischief. If his life be not taken away, the only other means left are confinement for life or transportation and exile for life. Neither of these is a perfect security against the commission of other crimes, and may not always be within the power of a nation without great inconvenience and great expense to itself. It is true that the latter punishments leave open the chance of reform to the offender, which is indeed but too often a mere delusion; but, on the other hand, they greatly diminish the influence of another salutary principle, the deterring of others from committing like crimes. It seems to us, therefore, that it is difficult to maintain the proposition that capital punishments are at all times and under all considerations inexpedient. It may rather be affirmed that in some cases they are absolutely indispensable to the safety and good order of society. Some states have, however, entirely abolished capital punishment, as is the case in Holland, Roumania, Portugal, a certain number of the Swiss cantons, and some states of the American Union. It was entirely abolished in Switzerland in

1874, but a few years after, owing to the increase of murders, it was again made permissible. It was also for a time done away with in Austria and one or two of the United States.

3. As to the *crimes* to which capital punishments may most properly be limited. From what has been already said it is plain that this must depend upon the particular circumstances of every age and nation; and much must be left to the exercise of a sound discretion on the part of the legislature. As a general rule humanity forbids such punishments to be applied to any but crimes of very great enormity and danger to individuals or the state. If any crimes can be effectually suppressed by moderate means, these ought certainly to be first resorted to. The experience, however, of most nations, if we may judge from the nature and extent of their criminal legislation, seems to disprove the opinion so often indulged by philanthropists that capital punishments are wholly unnecessary. The codes of most civilized nations used to abound with capital punishments. That of Great Britain long continued to be very sanguinary. Blackstone, in his Commentaries, admits that in his time not less than *one hundred and sixty crimes* were by the English law punishable with death. Forgery was one of these up to the reign of William IV. The only crimes for which capital punishment may now be inflicted, according to the law of England, are high treason and murder. The law in Scotland is substantially the same, a sentence of capital punishment now being competent only in cases of treason, murder, and attempts to murder in certain cases. In the code of the United States of America nine crimes are so punishable, comprising treason, murder, arson, rape, piracy, robbery of the mail. In several states of the Union still fewer crimes are generally punishable with death. Beyond treason, murder, arson, piracy, highway robbery, burglary, rape, and some other offences of great enormity, and of a kindred character, it is extremely questionable whether there can be necessity or expediency in applying so great a severity. Beccaria, with his characteristic humanity and sagacity, has strongly urged, indeed, that the certainty of punishment is more important to deter from crimes than the severity of it.

4. As to the *manner* of inflicting the punishment of death. This has been different in different countries, and in different stages of civilization in the same countries. Barbarous nations are generally inclined to severe and vindictive punishments; and, where they punish with death, to aggravate it by prolonging the sufferings of the victim with ingenious devices in cruelty. And even in civilized countries, in cases of a political nature, or of very great atrocity, the punishment has been sometimes inflicted with many horrible accompaniments. Tearing the criminal to pieces, piercing his breast with a pointed pole, pinching to death with red-hot pincers, starving him to death, breaking his limbs upon the wheel, pressing him to death in a slow and lingering manner, burning him at the stake, crucifixion, sawing him to pieces, quartering him alive, exposing him to be torn to pieces by wild beasts, and other savage punishments, have been sometimes resorted to for the purposes of vengeance, or public example, or public terror. Compared with these, the infliction of death by drowning, by strangling, by poisoning, by bleeding, by beheading, by shooting, by hanging is a moderate punishment. In modern times public opinion is strongly disposed to discountenance the punishment of death by any but simple means; and the infliction of torture is almost universally reprobated. Even in governments where it is still countenanced by the laws it is rarely resorted to; and the sentence is remitted, by the policy of the government, beyond the simple infliction of death. In Prussia, where atrocious criminals were required by the penal code to be broken upon the wheel, the king latterly used always to issue an order to the executioner to strangle the criminal (which was done by a small cord not easily seen) before his limbs were broken. So in the same country, where robbery, attended with destruction of life, was punished by burning alive, the fagots were so arranged as to form a kind of cell, in which the criminal was suffocated by the fumes of sulphur, or other means, before the flame could reach him. Not only is torture now abolished by civilized nations, but even the infliction of capital punishment in public has been given up by most of them. In England, in high treason, the criminal is sentenced to be drawn to the gallows, to be hanged by the neck until he be dead, to have his head cut off, and his body divided into four parts, and these to be at the disposal of the crown. But, generally, all the punishment is remitted by the crown, except the hanging and beheading, and these too may be altogether remitted according to circumstances. In other cases the punishment is now simply by hanging, or, in the military and naval service, by shooting. In France formerly the punishment of death was often inflicted by breaking the criminal on the wheel. The usual punishment now is beheading by the guillotine. In 1853 a kind of guillotine (*Fallschwert*) was introduced into the Kingdom of Saxony, and it has since been adopted as the means of execution in several other German states. In Austria the general mode of punishment is by hanging. In Prussia hanging is rarely inflicted; but the usual punishment is beheading with a heavy axe, the criminal's head being first tied to a block. In one or two German states execution by the sword still exists. It should be remarked, however, that in Germany hanging has always been deemed the most infamous sort of punishment; and the sentence has often been commuted for beheading by the sword as a milder or less dishonourable mode of punishment. In the United States of America hanging is the almost universal mode of capital punishment, though electricity has recently been tried. The constitution of the United States contains a provision against 'cruel and unusual punishments.' In China murderers are cut to pieces; robbers not. In Russia the punishment of death has been frequently inflicted by the knout. In Turkey strangling and sewing the criminal up in a bag, and throwing him into the sea, are common modes of punishment. In the Roman code many severe and cruel punishments were prescribed. During the favoured times of the republic many of these were abolished or mitigated. But again, under the emperors, they were revived with full severity. In the ancient Grecian states the modes of punishment were also severe, and often cruel. Whether the ancient Greek mode of capital punishment by taking poison at such hour as the condemned party should choose has ever been adopted in any modern nation we are unable to say. As far as we have been able to learn, it has never been in use among any Christian people.

Whether executions ought to be in public or in private has been a question much discussed, and upon which a great diversity of opinion exists among intelligent statesmen. On the one hand, it is said that public spectacles of this sort have a tendency to brutalize and harden the people, or to make them indifferent to the punishment; and the courage and firmness with which the criminal often meets death have a tendency to awaken feelings of sympathy, and even of admiration, and to take away much of the horror of the offence, as well as of the punishment. On the other hand, it is said that the great

influence of punishment, in deterring others from the like offence, cannot be obtained in any other way. It is the only means to bring home to the mass of the people a salutary dread and warning; and it is a public admonition of the certainty of punishment following upon crimes. It is also added that all punishments ought to be subjected to the public scrutiny, so that it may be known that all the law requires, and no more, has been done. Since 1868 the law of the United Kingdom has required all executions to take place privately within the prison walls, and this system seems to have given general satisfaction. The same method is also practised in various other countries. In 1870 a similar measure was proposed in the French assembly, but the war prevented it being passed and it is not yet law.

In England, the court before which the trial is held declares the sentence, and directs the execution of it. In the courts of the United States there is a like authority; but in the laws of many of the states there is a provision that the execution shall not take place except by a warrant from the governor, or other executive authority. In cases of murder and other atrocious crimes the punishment in England is usually inflicted at a very short interval after the sentence. In America there is usually allowed a very considerable interval, varying from one month to six months. In Britain and America there lies no appeal from the verdict of a jury and the sentence of a court, in capital cases. In France there may be a review of it in the Court of Cassation. In Germany there is, in criminal as in civil cases, a right of appeal; hence, in that country, few innocent persons have suffered capitally since the sixteenth century; and in England and America the very fact that the verdict and sentence are final produces great caution and deliberation in the administration of criminal justice, and a strong leaning towards the prisoner on trial. Capital punishment cannot be inflicted, by the general humanity of the laws of modern nations, upon persons who are insane or who are pregnant, until the latter are delivered and the former become sane. It is said that Frederick the Great required all judgments of his courts, condemning persons to death, to be written on blue paper; thus he was constantly reminded of them as they lay on his table among other papers, from which they were readily distinguished. He usually took a long time to consider such cases, and thus set an excellent example to sovereigns of their duty.

CAPITALS (*majuscula*), the large letters used in writing and printing, most commonly as the initial letters of certain words, or of all words in certain positions, and distinguished from the small letters (*minuscula*). As among the ancient Greeks and Romans, so also in the early part of the middle ages, all books were written without any distinction in the kind of letters used; but gradually the practice became common of beginning a book, subsequently, also, the chief divisions and sections of a book, with a large capital letter, usually illuminated and otherwise richly ornamented. In legal or state documents of the thirteenth century capital letters are found dispersed over the text, as the initial letters of proper names, and in the name of the Deity, and in the next century the same usage was followed in ordinary manuscripts. The practice, with regard to the use of capitals, varies in different countries. Sentences and proper names begin almost universally with capitals, but there are several other cases in which the usage is not so general. In English there cannot be said to be any invariable rule regulating their use. The first personal pronoun is always written and printed with a capital letter, and it is common also to begin titles and the names of well-known public bodies, societies, institutions, &c., with capitals. Formerly, it was a frequent practice to begin all substantives in English with a capital, which is still the rule in German. The Germans also begin all titles and pronouns of address with capitals, but not the first personal pronoun. One point in which the English practice differs from that of Germany, France, Italy, and other continental countries, is in beginning adjectives derived from proper names, such as Spanish, Italian, &c., like proper names themselves, with capitals, such adjectives being printed in other countries entirely with small letters.

CAPITANATA. See FOGGIA.

CAPITANIS, the hereditary chieftains of certain bands of Christian warriors who, about the beginning of the sixteenth century, retired to the mountain fastnesses of northern Greece, where they maintained a kind of independence of the Turkish government, and supported themselves by predatory incursions on the neighbouring provinces. They were hence called *klephtes*, that is, robbers. Ultimately, the Turkish government finding that it was impossible to subdue these robber bands, hit upon the plan of using them as a kind of police. It took them into its pay, and required them in return to abstain from hostilities on their own part, and to provide for the security of the public roads against those klephtes who refused to submit to the Turks, and all others who practised robbery and violence. But in spite of this agreement with the Turks, the armatoles had still in a great measure a common feeling with the klephtes whom they were appointed to repress, and still shared with them their violent hatred for the Turks. Accordingly, it was not an uncommon thing for a capitani who felt himself aggrieved or slighted by the Turkish government to go over with his band to the klephtes. When the cry for independence arose in Greece, it was eagerly taken up equally by armatoles and klephtes, who now together formed a numerous and powerful body, consisting of about 12,000 men; and from among the capitanis most of the Greek generals of that period arose; for example, Odysseus, Karatasso, Marko Bozzaris, &c. After the conclusion of the war and the establishment of Greece as an independent state, these armatoles were a subject of considerable embarrassment to the government; and those capitanis with their bands who refused to enter the Greek army, for the most part resumed their old calling of mountain robbers. See ARMATOLIC.

CAPITATION is applied to anything that concerns a number of persons individually. Thus a capitation-tax is a tax imposed upon all the members of a state, each of whom has to pay his share, and is distinguished from taxes upon merchandise, &c. A capitation-grant is a grant given to a number of persons, a certain amount being allowed for every individual among the number.

CAPITOL, now *Campidoglio*, the citadel of ancient Rome, standing on the Capitoline Hill, the smallest of the seven hills of Rome, anciently called the *Saturnine* and the *Tarpeian Rock*. It was planned and said to have been begun by Tarquinius Priscus, but not completed till after the expulsion of the kings. At the time of the civil commotions under Sulla it was burned down, and rebuilt by the senate. It again suffered the same fate twice, and was restored by Vespasian and Domitian. The latter caused it to be built with great splendour, and instituted there the Capitoline games. Dionysius says the temple, with the exterior pillars, was 200 feet long and 185 broad. The whole building consisted of three temples, which were dedicated to Jupiter, Juno, and Minerva, and separated from one another by walls. In the wide portico triumphal banquets were given to the people. The statue of Jupiter, in the capitol, represented him sitting on a throne of ivory and gold, and consisted in the earliest times of clay painted red. Under Trajan, it was formed of gold. The roof of the temple was made of bronze: it was gilded by Quintus Catulus. The doors were of the same metal. Splendour and expense were lavished upon the whole edifice. On the pediment stood a chariot, drawn by four horses, at first of clay, and afterwards of gilded brass. The temple itself contained an immense quantity of the most magnificent presents. The most important papers were preserved in it.—The Capitoline hill consists of three parts, namely, the northern summit, now occupied by the church of Santa Maria in Aracœli; the southern summit, crowned by the Palazzo Caffarelli, now occupied by the German ambassador; and the depression between these, in which is now the Piazza del Campidoglio. The above church, which is approached from the north-west by a lofty flight of steps, is of great antiquity. In 1888 the Franciscan monastery which was connected with it was replaced by a large monument of Victor Emmanuel II. The Piazza del Campidoglio was designed by Michael Angelo. In its centre is a fine equestrian bronze statue of Marcus Aurelius. On the south-east side there is the Palazzo del Senatore, with a fine flight of steps erected by Michael Angelo. The Palace of the Conservatori occupies the south-west side of the square, and contains valuable collections in art and antiquities. Directly opposite is the Capitoline Museum, founded by Innocent X. The southern summit of the hill is now called Monte Caprino, and on it, beside the Palazzo Caffarelli already mentioned, stands a hospital and a German archæological institute.—The name of *capitol* is also given to the edifice in Washington where Congress assembles. Some of the states of North America also call their state-houses *capitols*.

CAPITOLINE GAMES, games held in ancient Rome in celebration of the deliverance of the city from the Gauls, and in honour of Jupiter Capitolinus, to whom they ascribed the salvation of the capitol in the hour of danger. They were instituted B.C. 387, after the departure of the Gauls.

CAPITULARY, a writing divided into heads or chapters (L. *capitula*), especially a law or regal enactment so divided into heads. Laws known by this designation were promulgated by Childebert, Clothaire, Carloman, and Pepin, kings of France; but no sovereign seems to have put forth so many of them as the Emperor Charlemagne, who appears to have wished to effect, in a certain degree, a uniformity of law throughout his extensive dominions. With this view it is supposed he added to the existing codes of feudal laws many other laws, divided or arranged under small chapters or heads, sometimes to explain, sometimes to amend, and sometimes to reconcile or remove the differences between them. These were generally promulgated in public assemblies, composed of the sovereign and the chief men of the nation, both ecclesiastical and secular. They regulated equally the spiritual and temporal administration of the kingdom; and the execution of them was intrusted to the bishops, the courts, and the *missi regii*, officers so called because they were sent by the French kings of the first and second race to dispense law and justice in the provinces. Many copies of these capitularies were made, one of which was generally preserved in the royal archives. The authority of the capitularies was very extensive. It prevailed in every kingdom under the dominion of the Franks, and was submitted to in many parts of Italy and Germany. The earliest collection of the capitularies is that of Anségise, abbot of Fontenelles. It was adopted by Louis the Debonnaire and Charles the Bald, and was publicly approved of in many councils of France and Germany. But as Anségise had omitted many capitularies in his collection, Benedict, the Levite or deacon of the church of Mentz, added three books to them. Each of the collections was considered to be authentic, and of course was appealed to as law. Subsequent additions have been made to them. The best editions of them are those of Baluze (two vols. Paris, 1677) and of Pertz in the Monumenta Germaniæ Historica (2nd div. vols. i. and ii.; Hanover, 1835–37). The capitularies remained in force in Italy longer than in Germany, and in France longer than in Italy. The incursions of the Normans, the intestine confusion and weakness of the government under the successors of Charlemagne, and above all the publication of the epitome of canon law termed the Decretum of Gratian, about the year 1150, which totally superseded them in all religious concerns, put an end to their authority in France.

CAPITULATION formerly signified a writing drawn up in heads; but is now commonly used in military language to signify the act of surrendering to an enemy upon stipulated terms, in opposition to *surrender at discretion*. In the fifteenth century *capitulations*, as they were called, were presented by the ecclesiastical establishments in Germany to their newly chosen abbots and bishops, who were obliged to swear to observe them as laws and conditions for their future rule. The ecclesiastical electors obtained, after the fall of the Hohenstaufen family, certain advantageous promises from the new emperors, which were called *capitulations*. When Charles V. was proposed as emperor, and it was apprehended, on account of his foreign education, that he would disregard the German constitution, he was obliged to make oath that he would not reside without the German Empire, nor appoint foreigners to office in the empire, &c. This was called his *election capitulation*. Such a *Wahlcapitulation* was afterwards presented to every new emperor as a fundamental law of the empire. In this way the authority of the German emperors was constantly more and more diminished, so that at last it became merely nominal, since the electors, at the choice of every new emperor, made some new infringement on the imperial privileges. The *Wahlcapitulationen* were acknowledged bargains, certainly unique in history.

CAPNOMANCY, divination by smoke, one of the modes of divination resorted to by the ancients. They used to burn vervain or some other sacred plant, and observe the form and direction which the smoke took in escaping, and from these circumstances they drew their auguries. Sometimes the smoke of sacrifices was observed instead of that of vervain. When this smoke was thin and transparent, it was considered a good omen; if, on the contrary, it was thick and opaque, the omen was bad. Another method of acquiring a knowledge of the future by capnomancy was to throw the seeds of jasmine or poppy on burning coals, and to observe the smoke which rose from them.

CAPO D'ISTRIA (the ancient *Ægida*, later *Justinopolis*), a seaport of Austria, on the Gulf of Trieste, 9 miles s. of Trieste. It is connected with the mainland by a causeway rather more than half a mile long. It is defended by an old fort now going to decay. It contains a cathedral, a lofty edifice, faced in the Venetian style with marble, and containing some fine paintings, sculptures, and arabesques. It is the seat of a bishop, and has six monasteries and two nunneries, a gymnasium, several hospitals, and a penitentiary. There are manufactories of soap, candles, leather, and sea-salt; and there is also a considerable trade in wines, oil, and fish. After the tenth century Capo d'Istria belonged, alternately, to the Venetians and Genoese, till finally, in 1478, it succeeded in making itself independent of the latter with the aid of the former. Capo d'Istria now became the capital of Istria, and along with it came into the possession of Austria in 1815. Pop. (1890). 8191.

CAPO D'ISTRIA, John Antony, Count of, Russian secretary of state, afterwards president of Greece, was born at Corfu in 1776 or 1780. In 1809 he entered the service of Russia and obtained an appointment in the department of foreign affairs. Afterwards he went with the Russian embassy to Vienna. As imperial Russian plenipotentiary he subscribed the Treaty of Paris, Nov. 20, 1815, and returned with his monarch to St. Petersburg, where he took a very active part in the business of the council of state. But as Russia disapproved of the attempts of the Greeks, Count Capo d'Istria left the public service in 1822, and retired as a private man to Germany and Switzerland, living chiefly at Geneva till the year 1827, when he was elected president of the Greek Republic. Whether from his attachment to Russian interests, or from the jealousy and impatience of restraint of the chiefs, Capo d'Istria speedily became extremely unpopular. Several of these unruly chiefs belonging to the islands and to the province of Maina at last, in the spring of 1831, rose in open rebellion against him, demanding a convocation of the national assembly, the establishment of the liberty of the press, and the release of certain state prisoners, especially of Petros Mauromichalis, one of their own number whom Capo d'Istria had arrested and imprisoned. Capo d'Istria obtained the aid of Russia, but before the insurrection could be quelled he was assassinated by Constantine and George Mauromichalis, the brother and nephew of Petros Mauromichalis (Oct. 9, 1831).

CAPONIERE, or Caponniere, in fortresses, a place which is covered against the fire of the enemy on the sides, sometimes also above, and serves for the connection of two works, or for maintaining an important point. In particular—1, a passage secured by two parapets, in the form of *glacis*, which leads through the dry ditch from one work to another; for instance, from the chief wall to the ravelin. If danger is to be apprehended only from one side, and consequently only one parapet is made, it is called a *demi-caponniere:* if it is covered above with hurdles or with wood, it is called a *coffer:* but this word is often used indifferently for *caponniere*.—2. Small block-houses in the covered way, for its defence. Coehorn laid out similar, but less useful works below the glacis, and Scharnhorst proposes them, under the name of *field-caponnieres*, for the salient angles of field fortification.

CAPPADOCIA, in antiquity, one of the most important provinces in Asia, once a famous kingdom; in its widest extent bounded w. by Lycaonia, s. by Cilicia and Syria, E. by Armenia, and N. by the Pontus Euxinus. In the period of the Persian government Cappadocia comprehended all the country between the Halys and Euphrates. By the former river it was separated from Phrygia and Paphlagonia; by the latter, from Armenia: therefore the region afterwards called *Pontus* was comprehended in this territory. The Persians divided it, according to Strabo, into two satrapies, which bore the name of *Cappadocia Magna*, afterwards *Cappadocia Proper;* and *Cappadocia Minor*, afterwards *Pontus*. This division, however, was not always strictly observed. The Persian satraps governed, at a later time, under the title of *kings*, and sometimes made themselves independent. At the time of the famous retreat of the 10,000 Greeks, both the Cappadocias seem to have been under the rule of Mithridates, who had participated in the conspiracy of Cyrus the Younger, but retained his government and became, after the defeat of Cyrus, again dependent upon the kings of Persia. Cappadocia Magna was a good grazing country, and also well adapted for the cultivation of grain, especially wheat; but wood was scarce. Mazaca, afterwards Caesareia, now Kaisariyeh, was the residence of the kings of Cappadocia. The name of *Leukosyri* (White Syrians) is said by Strabo to have been applied to the Cappadocians, as if to distinguish them from the dark Syrians who dwelt to the E. of Mount Amanus.

CAPPEL, a village in Switzerland, in the canton of Zürich, and 10 miles from the town of Zürich. It contains an old Cistercian convent, founded in 1185, and a simple monument erected in 1838 to the reformer Zwingle, who was killed, Oct. 11, 1531, in a contest which took place near Cappel. Pop. 600.

CAPRARA, Giambattista, a cardinal of the Roman Church, born at Bologna in 1733. He studied theology, became vice-legate of Ravenna in 1758 under Benedict XIV., and in 1785 was sent by Pius VI. as nuncio to Vienna, to remonstrate with the Emperor Joseph on his conduct in relation to church matters. His remonstrance proved ineffectual, but in 1792 he was appointed a cardinal, shortly afterwards a member of the state council, and in 1800 Bishop of Jest. In 1801 he went to Paris as legate of Pius VII., and conducted the negotiations with the French Republic with so much success that in 1802 the first concordat was concluded. Shortly after, he was appointed Archbishop of Milan, and in 1805 he crowned Napoleon king of Italy. He latterly became blind, and died at Paris in 1810.

CAPREA, or Capreæ. See Capri.

CAPRERA, a small island in the N.E. of Sardinia, and separated from it by a narrow strait. It is 6 miles long from N. to S., and 2 miles broad. It is fertile, and produces both corn and good pasture. It is now well known as the ordinary residence of Garibaldi, who since 1854 possessed a dwelling-house on the island, along with a piece of ground which he farmed until his death here in 1882.

CAPRI, an island in the beautiful Gulf of Naples, which contributes not a little to the charms of this favourite scene of nature. Capri, 5 miles long and 2 broad, lies at the entrance of the gulf, and consists of two mountains of limestone, remarkable for their picturesque shape, and a well-cultivated valley. The inhabitants, amounting to 4600, are occupied in the production of oil and wine, in fishing and in catching quails, which come in immense numbers from Africa to the shores of Italy. Every spot on the island which can be made productive is cultivated. In fact, agriculture all around Naples is in the highest state of perfection. The town of Capri is the seat of a bishop, to whom all the quails belong. A high rock separates Capri from the little town of Anacapri, 1600 feet high, which is reached by 522 steps cut in the rock. With the Romans Capri was called *Capreæ*. Augustus obtained it from the Neapolitans in exchange for Ischia, and made it a place of agreeable retreat, but never made use of it. Tiberius spent here the last seven years of his life in degrading voluptuousness and infamous cruelty. The ruins of his palaces are still extant, and other ruins are scattered over the island. The island of Capri is remarkable for several remarkable caverns or grottoes in its steep rocky coast. By far the most remarkable of these is unquestionably the celebrated *Grotta azzurra* (Blue Grotto), which was discovered by a singular accident in the summer of 1832, an Englishman while bathing having observed the open ing in the rocks which forms the entrance to the grotto, and swum into it. It gets its name from the fact that, while the sun is shining outside, all the objects within the cavern—rocks, water, sand—are tinged with a beautiful blue colour, very soft and agreeable to the eye. The cavern is elliptical in form, measuring about 1200 or 1300 feet in circumference; its height is considerable, and its roof and sides bristle with stalactites. The blue colour within the grotto is supposed to be caused by the refraction of the rays of light in passing through the water before entering the cave. The blue rays, with those next to them, the violet and the indigo, being the most refrangible, are the only rays that are admitted, the others—red, orange, &c., being dispersed in the water. In another part of the coast there is another grotto which exhibits phenomena precisely similar, except that the objects in this one are clothed with a green instead of a blue colour. It is hence called the *Grotta verde* (Green Grotto).

CAPRICCIO. *Caprice* is the name applied to a sort of musical composition, in which the composer follows the bent of his humour. The *capriccio* may be used with propriety in pieces for exercise, in which the strangest and most difficult figures may be introduced, if they are not at variance with the nature of the instrument or of the voice.

CAPRICORN, TROPIC OF. See TROPICS.

CAPRIFICATION, the name given to a horticultural operation performed by the ancients upon figs, with the view of hastening their maturity, and still practised in some districts of the Levant. It consists in suspending by threads above the cultivated figs branches of the wild fig covered with a species of Cynips, a kind of small insects, which, coming out, spread themselves over the tree, and contracting pollen from the flowers, carry it into the fruit, which they afterwards penetrate. It has been supposed that a fecundatory process thus takes place, but others maintain that the mere pricking of the fruit by the Cynips is the sole cause of any ripening result thus obtained, and support their view by referring to a similar effect frequently produced in ordinary orchards, the fruit pierced by the larvæ of insects being usually the first that ripens. The process cannot be of much practical value, as in all countries where figs grow they are obtained in perfection without the intervention of Cynips.

CAPSICIN is the name given to two apparently different substances. One described by Braconnot, obtained from chilly pepper, is an acrid oil or oleoresin, of a reddish-brown colour, the vapour of which excites sneezing and coughing. It is probably a mixture of different bodies. The other is a resinoid substance obtained from cayenne pepper; it is brown with a golden tint, has the consistence of tar, an aromatic smell and pungent taste, and is used in America as a powerful stimulant in influenza fever, indigestion, and other disorders, and externally as a rubefacient. Quite recently a volatile alkaloid has been obtained from chilly pepper, by first removing the acrid resin, then making the fluid alkaline, and extracting with petroleum spirit. On evaporating, a substance is got, with an odour like that of conia. It is distinguished from conia and nicotine by a variety of reactions.

CAPSICUM. See CAYENNE PEPPER.

CAPSTAN, in its general form on board ships, a strong upright column of timber, movable round a strong iron spindle, and having its upper extremity pierced to receive bars or levers, for winding a rope round it to raise great weights, such as the anchors of a vessel, or to perform other work that requires great power. It may be let down through the decks of a ship, so that bars may be worked on two decks, and more room obtained for the men. The capstan bars are long pieces of wood of the best ash or hickory, the ends of which are thrust into the square holes in the head of the capstan, so as to appear like the spokes of a wheel. The capstan is turned by the men setting their hands and breast against these bars and walking round. The capstan is kept from recoiling by means of what are called pauls—short bars of iron which catch in projections or notches on the capstan. Capstans are made in various ways, but they all act on the principle of the wheel and axle.

CAPSULE, in botany, a dry fruit containing several seeds, sometimes a large number, and opening of itself by means of valves or pores when it comes to maturity. According as it contains one, two, three or more cells, the capsule is called *unilocular*, *bilocular*, *trilocular*, &c., and when it has many cells it is called *multilocular*.

CAPTAIN. This is one of those many words derived from the Latin of the middle ages, and now to be found in all the different idioms of Europe. Captain comes from the Latin *capitaneus*, from *caput*, head, and signified, first, a governor of a province, who in the first half of the middle ages was generally a military man. Thus the word captain soon came to be used chiefly to denote a high, or rather the highest military officer. Like many other words, however, this has in the course of time lost much of its dignity, and in military technology now signifies the commander of a small body, a company, and in maritime language the master of a vessel. In the navy it indicates a specific rank, the captain being distinctively the officer commanding a war-vessel. In the latter part of the middle ages, when armies were not yet so regularly divided and subdivided as at the present time, captains were the commanders of those small bodies of which the armies consisted. These were generally collected by their commander, who entered with his company into the service where most pay or most booty could be obtained. The practice of carrying war by troops collected in this manner prevailed to the greatest extent in Italy, where the continual quarrels of the numerous small states afforded ample employment to the unsettled and the dissolute. These companies play an important part in the history of the middle ages, particularly that of the two centuries preceding the reformation, and had a very important influence on the manners and morals of the south of Europe. They are further interesting to the student of history, because they are so unlike anything at present existing.

CAPTAIN, in modern armies, is the commander of a company of foot or a troop of horse. In the British army he appoints the sergeants, corporals, and lance-corporals of his company—a right which belongs in other armies to the commander of the regiment. In the foot-guards the captains have the rank of lieutenant-colonels in the army.

CAPTAIN, in the navy, an officer commanding a ship of war. The naval captain is next in rank above the commander, and in Britain ranks with a lieutenant-colonel in the army, but after three years from the date of his commission he ranks with a full colonel.

POST-CAPTAIN, a title now abolished, formerly that of a British officer commanding any man-of-war, from a ship of the line down to a ship-rigged sloop

CAPTAIN-GENERAL, the commander-in-chief of an army or of all the military forces of a country. In France it was an ancient title which conferred an almost unlimited power on the person who possessed it in the district where he commanded. But it never corresponded to that of generalissimo except in the case of the Duke of Savoy, in 1635, in the time of Louis XIII. The title is not in use at present, nor would it agree with the existing organization of the administration. In Spain the rank of a captain-general corresponds with that of a marshal of France, the captain-general having command of an army or army-corps. The title was also given to the head of a province in the Spanish colonies in South America, which were divided into viceroyalties and captain-generalships (*capitanias-generales*); thus Chili used to be a captain-generalship. The captains-general were not placed under the viceroys, but accountable only to the king through the council of the Indies. The captain-general of Venezuela, for instance, had no connection with the viceroy of New Granada. They decided, in the last instance, on all legislative, judicial, and military affairs, and presided in the *real audiencia*. The time during which these governors remained in power was limited to a few years, probably in order to prevent them from becoming too powerful. The consequence was, that the colonies were oppressed the more to enrich the governors, for rich every one was when he left his office.

CAPTAIN OF A MERCHANT SHIP, he who has the direction of a ship, her crew, lading, &c. In small vessels he is more ordinarily called *master*, which indeed is the correct title.

CAPTION, in English law, signifies that part of a legal instrument such as an indictment or commission, which states when, where, and by what authority it is executed. In Scotch law it signifies a warrant of imprisonment issued against a party to enforce an obligation, being now confined to a warrant served upon a party who has illegally retained papers in a lawsuit that had been borrowed by him, and intended to compel the return of the papers.

CAPTURE. See PRIZE.

CAPUA, or CAPOA, a city of Italy, in the province of Caserta, 18 miles N. of Naples, on the Volturno, which is crossed by a handsome bridge. The district is very fertile, but somewhat unhealthy. It is the seat of an archbishopric, and is the principal fortress that covers the approach to Naples. It has two magnificent gates, three principal streets, two handsome squares, and three public fountains. The town is dirty and badly built. The principal public buildings are the cathedral, with a cupola supported by eighteen columns, entirely modernized; the church of the Annunciation; the governor's palace, the town-hall, a museum with many ancient works of art, &c. Pop. (1881), 13,623.

The ancient city was situated 2½ miles S.E. from the modern town, which was built from its ruins on the site of the ancient Casilinum by the Lombards in the ninth century. The site is now occupied by a considerable town, called Santa-Maria-di-Capoa-Vetere. The ancient Capua, one of the finest and most agreeable cities of Italy, was of such extent as to be compared to Rome and Carthage. Hannibal wintered at ancient Capua after the battle of Cannæ, and thus not only lost time, but also is commonly said to have rendered his army unfit to follow up the advantage he had gained. It was a favourite place of resort of the Romans, on account of its agreeable situation and its healthy climate; and many existing ruins attest its ancient splendour. In A.D. 456 it was devastated by the Vandals under Genseric, and in 840 the Saracens completely destroyed it.

CAPUCHIN (or CAPUCIN) MONKEY, a name given to various species of South American monkeys of the genus *Cebus*, forming the type of the family Cebidæ. The short hair of their heads is so arranged that it has the appearance of a capuchin's cowl, hence the name. Their tails are long and prehensile. The species are all lively and sportive, and they are therefore frequently kept in a domesticated state. The general colour of the fur is a golden olive, a whiter fur bordering the face in some individuals; the face itself is almost naked or slightly downy. The name is most frequently given to the Sai or Weeper Sapajou (*Cebus Capuchinus*), of Brazil, the Horned or Brown Sapajou (*C. fatuellus*), as well as to the Red-backed Saki (*Pithecia chiroptes*), a monkey belonging to an allied species. The *Cebus apella* is shown in plate at article APE.

CAPUCHINS, monks of the order of St. Francis. See FRANCISCANS.

CAPYBARA, CAPIVARA, or CARPINCHO (*Hydrochœrus capybara*), a species of rodent, sometimes known by the name of the water-hog, and of the family Caviidæ. It attains the size of about a two-year-old hog, and has a very large and thick head, a cleft nose with strong whiskers on each side of it, small rounded ears, large black eyes, an upper jaw protruding considerably beyond the lower, a thick body covered with short, coarse, brown hair, and short legs, with long feet, which, being in a manner webbed, fit it for an aquatic life. It has no tail. It is common in several parts of South America, and particularly in Brazil. Its favourite food is sugar-cane; but it lives also partly on fish, which it catches somewhat in the manner of the otter. When a female which has young ones takes to the water they are said to sit on her back. See plate at RODENTIA.

CARABINE, or CARBINE, the name given to a short rifle, such as is carried by the British cavalry, artillery, and the Irish constabulary. The carabine of the British army, after having been a short Martini-Henry rifle, is now a short Lee-Metford. The carabine when not in use is carried in a leather case behind the right thigh of the mounted trooper. The name of Carabineers is given as an alternative title to the 6th Dragoon Guards, probably because they were the first regiment of cavalry to be armed with this weapon. See RIFLE.

CARABOBO, a state of Venezuela, washed on the N. by the Caribbean Sea; area, 2984 sq. miles. The capital is Valencia, and the chief port Puerto Cabello. Coffee, cacao, and sugar are cultivated. The village of Carabobo, 20 miles S.W. of Valencia, was the scene of the battle fought June 24, 1821, which was decisive of the independence of Colombia. Caracas, La Guayra, Carthagena, Cumana, and all that portion of Venezuela which is dependent upon them, were permanently secured to the patriots by this victory. Pop. (1894), 210,665.

CARACAL (*Felis caracal*), a carnivorous mammal of the family Felidæ, closely allied to the lynx, but of rather smaller size. It has the long legs and pencilled ears of the lynx, but its tail is longer, its fur not so close, and there is no ruff round the throat. Its colour is some light shade of brown, with perhaps some white on the under-parts; but the backs of the ears are black, and their insides white. It is found sparingly in many parts of India, in south-western Asia, and in Africa. It feeds on gazelles, hares, deer, and various birds.

CARACALLA, MARCUS AURELIUS ANTONINUS, eldest son of the Emperor Severus, was born at Lyons, A.D. 188. He was originally named Bassianus after his maternal grandfather, but when Severus gave himself out for the adopted son of the Emperor Marcus Aurelius, he changed his child's name to Marcus Aurelius Antoninus. Caracalla was a nickname given to him from a kind of Gaulish cloak which he wore. When his father died at York in 211, he was succeeded by Caracalla and his brother Geta. The two brothers, from their earliest years, hated one another inveterately, and Caracalla soon resolved to get rid of his brother by causing him to be assassinated. After many unsuccessful attempts he pretended to desire a reconciliation, and requested his mother to procure him an interview with his brother in private in her chamber. Geta appeared, and was stabbed in his mother's arms, A.D. 212, by several centurions, Caracalla lending them his assistance. The prætorian guards were prevailed upon, by rich donations, to proclaim Caracalla sole emperor, and to declare Geta an enemy to the state. The tyrant caused Geta's children and friends to be put to death. (See Papinianus.) He never afterwards was free from the agonies of remorse and an evil conscience. His campaigns in Gaul, Germany, and elsewhere were all marked by equal cruelty and treachery. At Alexandria, whither he went to punish the people of the city for ridiculing him, he devoted the inhabitants for several days and nights to plunder and butchery, and seated himself, in order to have a view of the bloody spectacle, on the top of the Temple of Serapis. His desire to triumph over the Parthians induced him to violate a peace that he had formerly concluded with them, under the pretence that their king Artabanus had refused him his daughter in marriage. Suddenly crossing the Euphrates he found the country undefended, ravaged it, captured Arbela, and dug up the sepulchres of the Parthian kings. The Parthians retired beyond the Tigris and were preparing to attack the Romans the following year with all their forces. When the senate received from him information of the submission of the East, they decreed him a triumph, and the surname *Parthicus*. Being informed of the warlike preparations of the Parthians, he prepared to renew the contest; but Macrinus, the pretorian prefect, whom he had offended, assassinated him, A.D. 217. Caracalla erected at Rome some splendid monuments, magnificent baths, which bear his name, and a triumphal arch in commemoration of the achievements of Severus.

CARACAS, a city of South America, the capital of the Republic of Venezuela. It lies in a beautiful valley two or three miles wide and about fifteen long, and is surrounded by mountains eight or ten thousand feet in height. The mountains separate it from the sea, which at its port La Guayra is about six miles distant in a straight line. The distance by railway to La Guayra, however, is about twenty-three miles, owing to the circuitous route that had to be adopted for the line, which was very expensive to construct, and rises to a height of 3000 feet. Caracas is regularly laid out, but the streets are seldom more than fifteen feet wide, though paved and well kept. There are several lines of tramway, and cabs and hired carriages abound. Gas and the electric light are the chief illuminants, and the telephone is in common use. The dwellings as a rule are of one story, but many of the public buildings are handsome, the university in particular, which contains a library open to the public. Other buildings of note are the houses of congress, the federal palace, the federal courts, the government offices, and the opera-house. There are several good squares and pleasure-grounds, the finest of the latter consisting of a projecting spur of the mountains, several hundred feet high, which is terraced, and has a garden on the top, with a colossal statue of General Guzman Blanco. Bolivar, the liberator of Venezuela from the Spaniards, rests in a splendid tomb in a church used as a national pantheon; and there is a colossal equestrian statue of him, as well as other monuments. Caracas is the largest town in Venezuela, and a considerable centre of trade, chiefly in cacao, tobacco, and coffee. Pop. (1891), 72,429.

CARACCI. See Carracci.

CARACCIOLI, Francesco, born at Naples in 1752, was distinguished as a Neapolitan admiral, but entered the service of the Parthenopean Republic (which see) set up by the French republicans in 1799, and repelled a Sicilian-English fleet. When Ruffo took Naples, Caraccioli was arrested, and being tried by court-martial was condemned to death, and hanged at the yard-arm of a Neapolitan frigate. The court-martial had been ordered by Nelson, to whom the king had given command of the Neapolitan navy, and he has sometimes been blamed for bringing on a traitor his well-earned fate.

CARACTACUS, a British king who resisted the advance of the Romans under Aulus Plautius and Ostorius Scapula. He was a son of Cunobelin, king of the Trinobantes, and in A.D. 43, when Plautius landed, was at the head of the Catuvellauni. Plautius and his lieutenant Vespasian, who afterwards became emperor, defeated the British forces under Caractacus on several occasions, the chief battle probably taking place about Wallingford. When the Romans had pushed well down the Thames the Emperor Claudius arrived and took part in further military operations, but his stay was a very short one. Caractacus now established himself in South Wales among the Silures, whence he took every opportunity of harassing the Romans. In A.D. 47 Plautius was replaced by Ostorius Scapula, and that commander completely defeated Caractacus in a battle somewhere about Shropshire, probably at Caer Caradoc. The wife, daughter, and brothers of the British leader were captured, and Caractacus himself fled to the country of the Brigantes in the north, only to be delivered up by their queen Cartismandua into the hands of the Romans. He was taken to Rome and made to take part in a triumphal procession. Here he was led before the Emperor Claudius and an assembly of the people. When he came to the seat of the emperor he stopped and addressed him, and so won upon him by his noble behaviour and pathetic speech that he pardoned him. According to the Welsh Triads he lived four years longer, and his children became Christians and introduced Christianity into Britain.

CARADOC SANDSTONE. See Geology.

CARAFFA, a celebrated Neapolitan family, which has produced several distinguished commanders and statesmen:—Oliviero, born in 1406, was made a cardinal by Pope Paul II. in 1467. Sixtus IV. appointed him his legate to Alfonso of Naples, and in 1472 made him admiral of his fleet against the Turks, from whom he captured Smyrna, and the port of Satalia in Asia Minor. He died at Rome in 1511.—Carlo, born at Naples in 1517, served first in the Netherlands under the Spaniards, then entered the order of Malta, and was made a cardinal by his uncle Pope Paul IV., who, for his sake, stripped the Colonnas of their possessions. This involved them in a war with Philip of Spain, but the result proved favourable to the Caraffa family. Paul IV. was succeeded by Pius IV., who was a bitter enemy of the Caraffas, imprisoned them, and then caused the cardinal to be strangled in 1561.—Antonio, born at Naples in 1538, was made cardinal by Pius V., and intrusted with the superintendence of the congregation for the revision of the Bible, and an Exposition of the Canons of the Council of Trent. Under Gregory XIII. he became librarian of the Vatican, and died in 1591. He translated Theodoret's Commentaries on the Psalms, and the Orations of Gregory Nazianzen from Greek into Latin.—Antonio, another member of the family, distinguished himself in Hungary in the service of Austria, but made himself universally hated by his cruelty. He died at Vienna in 1693.

CARAITES, or Caræans. See Karaites.

CARAMAN. See Karaman.

CARAMANIA. See Karamania.

CARAMEL. When sugar is gradually heated, it loses water and other substances, and is converted into a dark mass with a characteristic smell and taste. This is crude *caramel*, which is used in cookery as a colouring and flavouring ingredient. It is a mixture of several bodies, of which three have been described:—*Caramelane*, a brown bitter body, soluble in water; *Caramelene*, a dark brown body, also soluble in water, and possessed of great tinctorial power; and *Caramelin*, a black substance, of intense colouring power, which exists both in a soluble and insoluble modification.

CARANA RESIN, a kind of balsamic resin obtained from the *Isica Caranna* on the Orinoco, and the *Bursera acuminata* on the Antilles, two trees belonging to the natural order Burseraceæ. The resin is frequently used in the countries in which it is obtained as a salve or plaster, and it is used as an article of commerce rolled up in leaves, or contained in the cavities of bamboo canes. It is of a brownish colour, and diffuses a very balsamic odour. It was formerly used as an application in case of wounds.

CARANJA, an island, W. coast Hindustan, between Bombay and the mainland; lat. 18° 53′ N.; lon. 73° E. It is 4 miles long and 2 broad, and is low and woody, excepting two remarkable hills called Great and Little Caranja Hills, the former near the S. part of the island, the latter on the N. Great Caranja is very conspicuous, being of a tabular form, with a steep declivity at each end.

CARAPACE, the name given to the upper part of the hard shell or case in which reptiles belonging to the order of the Chelonia are inclosed, the lower part being called *plastron*. The same name is also given to the upper part of the shell of the Crustacea, and to the case inclosing certain of the Infusoria.

CARAT is said to have derived its name from *qirrât*, which in Arabic signifies the pod of a leguminous plant, the seeds of which have, from time immemorial, been used in the East in weighing gold, because they never vary in weight when once dry. It is now a weight of 3⅙ troy grains, used in weighing pearls and precious stones, and also serves to express the relative fineness of gold. Twenty-four carats being assumed as the standard of gold perfectly free from alloy, every specimen, in proportion as it falls short of this purity, has a fineness of less than 24 carats—for example, if the alloy amounts to a sixth of the whole, it is 20 carats fine; or to a fourth, it is 18 carats fine.

CARAUSIUS, a Roman general, born among the Menapii, in Gallia Belgica. He was sent by the Emperor Maximian to defend the Atlantic coasts against the Franks and Saxons; but being suspected of permitting those pirates to commit their ravages in order to increase his own plunder when he afterwards captured their vessels, and foreseeing that he was likely to fall into disgrace, he landed in Britain and got himself proclaimed emperor by his legions (287 A.D.) In this province he was able to maintain himself six years, when he was assassinated by one of his officers named Allectus (293 A.D.)

CARAVACA, a town, Spain, in the province of Murcia, and 43 miles W. by N. of the town of Murcia; population (1887), 15,053. It occupies the side of a hill crowned by an ancient castle, and overlooking the river Caravaca, here crossed by a stone bridge; is well built, and has a handsome town-house and church, the latter with a lofty tower and some good sculptures and paintings. Its trade is chiefly in cattle, grain, and manufactures of woollen and hempen goods, paper, soap, earthen and copper ware.

CARAVAGGIO, a town and commune, Italy, Lombardy, 24 miles E. of Milan, on the Gera d'Adda, with 5535 inhabitants. It is celebrated as the birthplace of the two great painters, Polidoro Caldara and Michel Angelo Merigi, both called *da Caravaggio*. It was formerly surrounded by walls and defended by a strong castle. Its principal church has some good paintings. The commune is famous for its melons.

CARAVAGGIO. See Caldara.

CARAVAGGIO, Michel Angelo Amerighi, or Merigi da, a celebrated painter, born at Caravaggio, in the Milanese, in 1569, was at first a journeyman mason, but soon applied himself to the study of painting, studied in Milan and Venice, and afterwards went to Rome, where he distinguished himself. He may be considered as the inventor of a manner which has had a crowd of imitators. His characteristic traits are vigour and truth of *chiaroscuro*, combined with excellent colouring. He was fond of introducing broad and deep masses of shade, whereby a great effect is given to the light. To aid him in producing this effect the room in which he worked was illuminated by a skylight, and the walls were painted black. He excelled in the painting of naked figures. His faults are obvious. Narrow and servile imitation of nature was his highest aim. Annibale Caracci and Domenichino were, perhaps, less distinguished than Caravaggio during their lives, but after their death were ranked higher; because, without neglecting colouring and the study of nature, they aimed at correctness of design and dignity of conception. His violent character involved him in many difficulties. He died at Porto Ercole, 1609, in consequence of wounds received in a quarrel in which his violent nature had involved him. The painters who have imitated him most are Manfredi, Valentin, and Ribeira, called *Espagnolet*.

CARAVAN, or Karavan, a Persian word, used to denote large companies which travel together in Asia and Africa for the sake of security from robbers, having in view, principally, trade or pilgrimages. Such a company often have more than 1000 camels to carry their baggage and their goods. These walk in single file, and the line is often 4 or 5 miles long. To avoid the excessive heat, they travel mostly early in the morning. As every Mohammedan is supposed to visit the tomb of Mohammed once at least during his life, caravans of pilgrims go to Mecca every year from various places of meeting. Of the various caravans which proceed to Mecca every year, the most important has always been the Syrian. The place at which it meets is Damascus, and here the pilgrims and merchants assemble many weeks before the day of departure, which is always fixed according to the season of the year in which the feast of Bairam occurs, the pilgrims requiring to be at Mecca on the day of the feast. As these caravans serve mercantile as well as religious purposes, Mecca, on the arrival of the caravans, resembles a great fair, and this fair is indeed the most important in all the East. The journey from Damascus to Mecca and back occupies about four months. The leader of such a caravan to Mecca, who carries with him some cannon for protection, is called *Emir-el-Hadj* (Prince of the Pilgrims). Trading caravans choose one of their own number for a leader, whom they call *Caravan Bashi*. Much information on the subject of caravans is to be found in the travels of Niebuhr, who made many journeys with them, and describes them, as it is well known, minutely and faithfully.

CARAVANSARI, in the East, a sort of inn, situated in countries where there are no cities or villages for a considerable extent, to furnish travellers with a shelter. Some of them are built with much splendour, though they are generally unfurnished, and the traveller is obliged to bring with him not only his bed and carpet, but also to carry all his provisions and necessaries along with him. In many, the hospitality is gratuitous. It is common for a pious Mohammedan to establish, during his life or by will, one or several of such caravansaries. This kind of benevolence is considered peculiarly agreeable to the deity, and promotive of the eternal happiness of the founder. Sometimes persons are kept in these establishments to show the way to the caravans for some distance. See KHAN.

CARAVEL, formerly the name of different kinds of vessels; one used in Portugal of 100 to 150 tons burden, another a French fishing vessel used on the coasts of Normandy and Picardy of 10 to 15 tons, and a third a large Turkish ship of war.

CARAWAY (*Carum carui*), an umbelliferous biennial plant, with a tapering fleshy root, a striated furrowed stem, and white or pinkish flowers. It produces a well-known seed used in confectionery, and from which both a carminative oil is extracted and a spirit cordial distilled. It is largely grown in Essex and Kent, on strong and rich clays, and is sometimes sown with beans, but more usually with coriander and teazel, or coriander alone. After the coriander, which is only a preparatory crop, has been removed, the plants of the caraway are singled out, and repeatedly hoed and cleaned. It is cut about the beginning of July, and produces on an average about 8 cwts. per acre. It is a favourite crop with the Dutch.

CARBERRY HILL, a rising ground in Mid-Lothian, about 7 miles to the S.E. of Edinburgh, between Musselburgh and Ormiston, where Mary, queen of Scots, surrendered herself to the confederate nobles of the kingdom, June 15, 1567, just before her confinement in Loch Leven Castle.

CARBOLIC ACID (C_6H_6O), PHENIC ACID, PHENOL. This substance, discovered in 1834 by Runge, is obtained chiefly from coal-tar, but it is found besides in the products of destructive distillation of a great number of organic bodies, and it has been detected ready formed in some animal fluids. It is usually prepared from those portions of coal-tar which pass over, during rectification, between 300° and 400° Fahr., by agitating them well with potash or soda, which combines with the acid, washing with hot water, removing the oil which separates, and then neutralizing the alkaline fluid with a mineral acid. The carbolic acid, thus displaced, is washed with water, dried over chloride of calcium, and repeatedly rectified, the portion boiling at 370° being preserved. When pure, carbolic acid forms long colourless needles, which melt about 95° Fahr., at a higher temperature it catches fire and burns with a smoky flame. It is moderately soluble in water, and abundantly in alcohol and ether. It has a characteristic smell and burning taste; it attacks the skin, and is a powerful poison. To the chemist phenol is of great interest on account of its relationships, and the large number of derivatives which it forms. (See PICRIC ACID.) For surgical and sanitary purposes it is of importance on account of its disinfecting and antiseptic properties. It is employed dissolved in glycerine, and in water, as a plaster, as a soap, as a powder, and as a specially prepared dressing for wounds. Carbolic acid must not be confounded with *creosote*.

CARBON. This is the name of the element which exists, more or less pure, in charcoal, coke, coal, and such bodies. It is very widely distributed, and is an essential constituent of the tissues of plants and animals. It also occurs in the mineral kingdom, chiefly as carbonic acid, which is either free, as in the atmosphere; or combined, as in limestone, dolomite, marble, and all the other carbonates.

The element is capable of existing in three forms, in which its properties differ in almost every respect; they are the diamond, graphite or plumbago, and charcoal in all its varieties. Carbon is therefore an instance of *allotropy*. Further, as the crystals of the diamond and those of plumbago belong to different systems (see CRYSTAL), carbon is called a *dimorphous* body.

1. The diamond is the purest form of carbon. It has always been esteemed as the most valuable of the gems, a superiority which it owes to its hardness, lustre, and high refractive power. Diamonds are or have been brought from India, from Brazil, and from South Africa. Those of India used to be found pretty numerously in Golconda (Nizam's Dominions), but few are now met with. Those of Brazil, discovered at the commencement of the eighteenth century, belong to the district of Serra-do-frio. Here they exist disseminated through a loose ferruginous sandstone, or quite detached in a sandy soil, and in both cases are situated at no great depth below the surface. In Brazil the conglomerate in which they exist is called *cascalho*, from which they are extracted by washing, in the same manner as gold. The diamonds of South Africa are found chiefly in the neighbourhood of the rivers Vaal and Orange, and have been known only in recent times, the first stone having been picked up in 1867, and others having soon followed. The fame of this discovery soon attracted many diamond-seekers, and the mines of Kimberley and neighbourhood have become the chief source of diamonds at the present day. (See CAPE COLONY). The diamond uniformly occurs crystallized, and presents a great variety of forms, all of which yield readily to mechanical division parallel to the planes of the regular octahedron, which, therefore, is the form of the primary crystal, and under which figure it is sometimes found in nature. The faces of its crystals are very frequently curved, so as to communicate to them a rounded appearance, and one form of it, with forty-eight rounded faces, becomes almost a sphere. The faces of the crystals are often striated parallel to the edges of the octahedron, and they often exhibit also impressions or indentations which are frequently of a triangular shape. Twin crystals are not uncommon. 'Notwithstanding the ancient belief that a true diamond could bear the blow of a hammer, it is rather a brittle stone, not only splitting along the cleavage-planes, but breaking elsewhere with a conchoidal fracture. The hardness of the diamond is indicated as 10 on the mineralogical scale, but it is so greatly superior to that of any other mineral that this is merely an arbitrary expression. Crystals from different localities vary considerably in degree of hardness: thus, lapidaries assert that Indian diamonds are harder than the Brazilian, and these again, harder than South African stones. The hardness may vary on different faces of a single crystal, and even in different directions on the same face.' They are commonly limpid and colourless, or they may be of a yellowish, bluish, yellowish-brown, black-brown, Prussian blue, or rose-red colour. The specific gravity of the diamond is 3·5. From its hardness the diamond can be worn down only by rubbing one diamond against another, and is polished only by the finer diamond powder. The weight and consequently the value of diamonds, are estimated in carats, one of which is equal to four grains; and the price of one diamond compared with that of another of equal colour, transparency, and purity, is as the squares of the respective weights, although this does not hold good in regard to the heavier

stones, which are disposed of at prices inferior to their value by that computation. As to the cutting of diamonds, their uses, &c., see Diamond.

From the fact that transparent inflammable bodies refract light in a ratio greater than their densities, Sir Isaac Newton conjectured that the diamond might consist of an unctuous matter coagulated. The Florentine academicians had rendered its combustibility probable, by exposing it to the solar rays of a powerful burning-glass, and observing that it gradually disappeared, or was consumed. Subsequent experiments settled the question by proving that the diamond lost none of its weight when calcined out of contact with the air, but on the contrary, that it was dissipated when heated in contact with it. It still remained, however, to be discovered what was the true nature of the diamond. This was accomplished by Lavoisier, who inclosed diamonds in jars filled with atmospheric air or oxygen gas, and after having caused them to disappear by the heat of a burning-glass, examined the air in the vessels. He found it to exhibit precisely the same properties as the air which results from the combustion of charcoal. Since then the diamond has been repeatedly burned in order to investigate its composition, and to fix the combining weight of carbon. It has thus been ascertained that the diamond is pure carbon, but that there is sometimes a slight fixed residue, consisting of iron and silica, but whether or not essential to the diamond is not quite certain. The combining weight assigned to carbon from these experiments is 12. Morveau demonstrated the nature of the diamond by another kind of arrangement. A diamond was inclosed in a cavity made in a piece of pure soft iron; a stopper of the same metal was driven into it, and the mass was put into a small crucible, which was covered, and this into a second; the space between them being filled with pure silicious sand. The whole was exposed for some time to an intense heat. When examined, the diamond had disappeared, and the iron with which it had been in contact was converted into steel. Now steel is a compound of iron and carbon; and as the diamond was not visible, and as there was no source from which the carbon could have been obtained, the conclusion was unavoidable that the diamond was pure carbon. Yet so different is this mineral from charcoal, that it was for a time imagined that it contained some other element than carbon; but the numerous and delicate experiments of Sir H. Davy, and several other chemists, failed of detecting anything else in its composition; and although there exists so great a difference between the diamond and charcoal in their external properties, they are now believed to be identical. The diamond is therefore pure carbon, and differs from charcoal (leaving out of question its trifling impurities) only in its external properties.

2. Graphite, plumbago, or black-lead is the next purest form of carbon. It is hardly so pure as diamond, for it contains sometimes as much as 5 per cent. of foreign matter, chiefly iron and silica. It has a steel-gray or leaden colour, and metallic lustre; it is soft and makes a streak on paper; it is a good conductor of electricity. It occurs in two forms: in one it crystallizes in the hexagonal system, in six-sided plates, and sometimes in masses; in the other it is amorphous, and is called plumbago. It used to be obtained in quantity in Cumberland, but the supply from that quarter is at present exhausted. It is got principally in Germany, the United States, and other countries.

Besides these physical differences between it and the other forms of carbon, it is distinguished from them by yielding a crystalline acid when repeatedly treated with oxidizing agents. This substance is termed graphitic acid, and from a consideration of its properties graphite has had assigned to it the number 33 as its combining weight. See Graphite.

Lastly, carbon in an amorphous state forms the chief constituent of all the varieties of coke, charcoal, and coal. In the whole of them, however, there are impurities, generally earthy matter, which constitutes the ash, while in coal the carbon is combined with hydrogen, nitrogen, oxygen, and probably other elements. See Coal.

Lampblack is charcoal in a state of minute division, and is prepared for the demands of trade from the dregs which remain after the eliquation of pitch, or else from small pieces of fir-wood, which are burned in furnaces of a peculiar construction, the smoke of which is made to pass through a long horizontal flue, terminating in a close, boarded chamber. The roof of this chamber is made of coarse cloth, through which the current of air escapes, while the soot, or lampblack, remains behind.—*Coke* is a peculiar kind of charcoal, which remains in the retort after the heating of coal to procure the coal-gas.—*Gas-carbon* is a very hard variety of coke which collects when gaseous hydro-carbons are heated in red-hot vessels. It is a good conductor of electricity, and is used in certain forms of the galvanic battery.

Bone-black, *ivory-black*, or *animal charcoal*, is obtained from bones made red-hot in a covered crucible, and consists of charcoal mixed with the earthy matters of the bone. It is used in vast quantities by sugar refiners to decolorize the syrup preparatory to crystallizing the sugar, as mentioned in the article Bone Black.

Charcoal is prepared by piling billets of wood in a pyramidal form, with vacuities between them for the admission of air, covering them with earth, and setting fire to them. In consequence of the heat, part of the combustible substance is consumed, part is volatilized, together with a portion of water, and there remains behind the carbon of the wood, retaining the form of the ligneous tissue. Another process consists in heating the wood in close vessels, by which the volatile parts are driven off, and a charcoal remains in the retorts, not so dense as that obtained by the other process. When required pure, and in small quantities, for the purposes of the chemist, it may be obtained by immersing the wood in sand contained in a crucible exposed to heat. According to the experiments of Messrs. Allen and Pepys, the weight of charcoal obtained from 100 parts of different woods was as follows:—fir, 18·17; lignum vitæ, 17·25; box, 20·25; beech, 15; oak, 17·40; mahogany, 15·75. Wood charcoal, well prepared, is of a deep-black colour, brittle and porous, tasteless and inodorous. It is infusible in any heat a furnace can raise; but by the intense heat of a powerful galvanic apparatus it is hardened, and at length is volatilized, presenting a surface with a distinct appearance of having undergone fusion. The density of charcoal when freed from air is little short of that of the diamond itself, although its specific gravity has usually been considered as low as 2·00. Charcoal is insoluble in water, and is not affected by it at low temperatures; hence, wooden stakes which are to be immersed in water are often charred to preserve them.

Owing to its peculiarly porous texture, charcoal possesses the property of absorbing a large quantity of air or other gases at common temperatures, and of yielding the greater part of them when heated. It appears, from the researches of Saussure, that different gases are absorbed by it in different proportions. He found that charcoal prepared from box-wood absorbs, during the space of twenty-four or thirty-six hours, of

Ammoniacal gas,	**90**	**times its volume;**
Hydrochloric acid,	**85**	**do.**
Carbonic acid, .	**35**	**do.**
Oxygen, . . .	**9·25**	**do.**
Hydrogen, . .	**1·75**	**do.**

Charcoal likewise absorbs the odoriferous and colouring principles of most animal and vegetable substances. Thus, all saline substances, which, from the adherence of vegetable or animal extractive matter, are of a brown colour,—as crude tartar, crude nitre, impure carbonate of ammonia, and other salts,—may, after being digested through the medium of water with charcoal, be obtained white by a second crystallization. Resins, gum-resins, assafœtida, opium, balsams, essential oils, and many other substances, even those that have the strongest smell, are rendered nearly inodorous when they are rubbed with charcoal and water, or when solutions of them in alcohol are macerated with the charcoal, or filtrated repeatedly through it. A number of the vegetable tinctures and infusions also lose their colour, smell, and much of their taste by the same process. Common vinegar, on being boiled with charcoal powder, becomes colourless. Malt spirit, by distillation with charcoal, is freed from its disagreeable flavour. In the same manner wines also become colourless, and distilled waters lose their odours. Water which, from having been long kept in wooden vessels, as during long voyages, has acquired an offensive smell, is deprived of it by filtration through charcoal powder, or even by agitation with it for a few minutes, especially when a few drops of sulphuric acid have also been added. Hence, also, it has been found that by charring the inside of casks for keeping water, it may be preserved a long time without spoiling. Charcoal can even remove or prevent the putrescence of animal matter. If a piece of flesh has become tainted, the taste and smell may in a great measure be removed by rubbing it with charcoal powder; and it may be preserved fresh for some time by burying it in the same substance. To produce these effects, however, it is necessary that the charcoal should have been well calcined and newly prepared.

The uses of charcoal are extensive. It is used as fuel in various arts, where a strong heat is required without smoke, and in various metallurgic operations. By cementation with charcoal, iron is converted into steel. It is used in the manufacture of gunpowder. In its finer state of aggregation, under the form of ivoryblack, lampblack, &c., it is the basis of black paint; and mixed with fat oils and resinous matter, to give a due consistence, it forms the composition of printing ink.

Carbon can be made combine, directly or indirectly, with several of the elements. With hydrogen especially it forms a very large number of compounds, called hydro-carbons, which are possessed of the most diverse properties, chemical and physical. It is a matter of some difficulty, however, to make hydrogen and carbon combine direct. With oxygen, again, carbon forms only two compounds, but union between the two elements is easily effected. Thus, when charcoal is heated to a certain degree in the open air, or in oxygen gas, it takes fire, and burns with the production of an elastic vapour, which is commonly called *carbonic acid gas*, or more strictly *carbonic anhydride*. This gas is usually obtained, however, by other processes. It exists, combined with lime, in the different varieties of limestone, marble, and chalk; and if any of these substances be exposed to a strong heat, the carbonic acid is liberated and the lime remains. An easier mode of obtaining the gas in quantity is to decompose the limestone with hydrochloric or nitric acid.

From the experiment of the direct formation of this anhydride, by the combustion of charcoal in oxygen gas, its composition has been determined to be 27·27 carbon and 72·72 oxygen. Tennant illustrated its nature analytically, by passing the vapour of phosphorus over chalk, or the carbonate of calcium heated to redness in a glass tube. The phosphorus took oxygen from the carbonic anhydride, charcoal, in the form of a light, black powder, was deposited, and the phosphoric acid which was formed united with the lime.

Carbonic anhydride is a colourless gas which requires a pressure of thirty-eight atmospheres to condense it into a liquid. By allowing this liquid to evaporate, part of it passes into the state of solid carbonic anhydride. Its specific gravity compared with common air is 1·5277. It extinguishes the combustion of ordinary substances, and is incapable of supporting the respiration of animals, its presence, even in a moderate proportion, being soon fatal. An animal cannot live in air which contains sufficient carbonic acid gas to extinguish a lighted candle; and hence the practical rule of letting down a burning taper into old wells or pits before any one ventures to descend. When an attempt is made to inspire pure carbonic anhydride a violent spasm of the glottis takes place, which prevents the gas from entering the lungs. If it be so much diluted with air as to admit of its passing the glottis, it then acts as a narcotic poison on the system. It is this gas which so often proves destructive to persons sleeping in a confined room with a pan of burning charcoal.

At the ordinary temperature and pressure water dissolves about an equal volume of carbonic acid gas, but it will take up much more if the pressure be increased. Water and other liquids which have been charged with the gas under pressure lose this excess when the pressure is withdrawn. The effervescence accompanying the opening of a bottle of beer, or soda water, or champagne, is due to escaping carbonic acid gas. These beverages, as well as carbonic acid water, owe part of their agreeable pungency to the acid; and the flatness which they acquire when exposed to the air, and the mawkishness of boiled water, is due to some extent to the loss of the dissolved gas. Carbonic acid water has a slight acid reaction, and has considerable solvent powers. On the addition to it of sufficient lime-water a white precipitate of carbonate of calcium is produced. This precipitate is soluble in carbonic acid, but if the solution be boiled the excess of acid is expelled, and the carbonate of calcium is reprecipitated. This is the phenomenon usually observed when certain natural hard waters are boiled.

Carbonic acid gas occurs in great abundance in nature, both free and in combination, and it is produced by a number of actions going on at the earth's surface. Free, it exists uniformly diffused through the atmosphere to the extent of about four parts in ten thousand, and this proportion is found in air collected even at the tops of mountains and in balloons. There is a continual production of the gas going on by the combustion of fuel, by respiration (as can be shown by breathing for a short time into lime-water), by fermentation, and by the decay of animal and vegetable matter. In some localities, too, immense quantities of the gas are emitted from the ground, or from mineral springs or wells, as in the Grotto del Cane, the Cave of Montjoly in Auvergne, in the valley of Wehr, in the Eifel, and at many other places. Yet notwithstanding the bulk of the atmosphere is so vast, and the gases diffuse so rapidly, that no change in the quantity in the atmosphere is perceptible. The increase is further prevented by plants, which in sunlight decompose carbonic acid, fixing the carbon in their tissues and liberating oxygen. In combination with various metals carbonic acid is an abundant substance. The compounds are called *carbonates*, and some of them, such as the carbonates of calcium and magnesium, form great rock masses, and occur in all countries and in all formations. Other carbonates, though not so widely distributed, are very valuable as ores of different metals; for example, malachite or carbonate of copper; calamine or carbonate of zinc; witherite or carbonate of barium; carbonate of iron, which, mixed with clay, constitutes clayband, and with clay and coaly matter blackband ironstone, and so on. Other carbonates, of the greatest importance in technology, are manufactured from native compounds—such as washing soda from common salt, pearl ash from carnallite, white lead from metallic lead. The carbonates, with the exception of the alkaline carbonates, are insoluble in water, though some dissolve in carbonic acid water. They are crystalline, and are decomposed by treatment with an acid, and from most of them the acid is expelled by heating to a sufficiently high temperature. In this way limestone is converted into lime by burning in a kiln.

There is another gaseous compound of carbon with oxygen called *carbonic oxide*, which is produced whenever carbonic anhydride at a red heat is brought in contact with some substance which has a strong affinity for oxygen. This condition is fulfilled by igniting chalk, or any of the carbonates, with iron filings or charcoal. The carbonate is reduced to its caustic state, and the carbonic anhydride is converted into carbonic oxide by yielding oxygen to the iron or the charcoal. When the first is used an oxide of iron is the product; when charcoal is employed the charcoal itself is converted into carbonic oxide. A more convenient method is to heat crystals of oxalic acid with oil of vitriol. When the oil of vitriol becomes hot, it withdraws the elements of water from the oxalic acid, carbonic anhydride and carbonic oxide are evolved, and are then separated by passing them through caustic potash or lime-water, which absorbs the anhydride, but allows the oxide to pass. Its specific gravity is 0·9721. It is colourless and insipid. Lime-water does not absorb it, nor is its transparency affected by it. When a light is applied to a jar of carbonic oxide, the gas takes fire, and burns calmly at its surface, with a lambent, blue flame, forming carbonic anhydride. The same lambent, blue flame may be often seen on the top of a bright coal fire. It is not only incapable of supporting respiration, but is a very active poison; so that the presence of even small quantities of it in the air may be injurious. The composition of carbonic oxide has been ascertained by exploding 100 measures of the gas mixed with 50 of oxygen. In this way 100 measures of carbonic anhydride are obtained, from which it can be shown that carbonic oxide contains just half the quantity of oxygen that carbonic anhydride contains. By weight it consists of twelve parts of carbon and sixteen of oxygen in every twenty-eight parts; its formula is CO. Carbonic oxide combines with chlorine, forming a substance called *phosgene* gas.

CARBONARI (*colliers*, or rather *charcoal-burners*), the name of a large political secret society in Italy. According to Botta's Storia d'Italia the republicans fled, under the reign of Joachim (Murat), to the recesses of the Abruzzi, inspired with an equal hatred of the French and of Ferdinand. They formed a secret confederacy, and called themselves *carbonari*. Their chief, Capobianco, possessed great talents as an orator. Their war-cry was 'Revenge for the lamb mangled by the wolf!' which was meant to express their intention to avenge those who had been oppressed by tyrants. Ferdinand and Caroline endeavoured to obtain their assistance against the French. Prince Moliterni, himself a republican at heart, was sent to them for this purpose. Count Orloff, in his work on Naples, ascribes the foundation or revival of the Carbonari to Queen Caroline of Naples: others assert that Maghella, the former minister of police, gave this society its greatest importance. Maghella, a native Genoese, was made minister of police in the time of the Ligurian Republic, and, after it was united with France, director of the tobacco monopoly. When Murat ascended the throne of Naples he employed him in the department of police, and, after the lapse of some time, appointed him minister. All his efforts were directed to the union and independence of Italy; and for this purpose he made use of the society of the Carbonari, which he reformed and extended. In 1812 he urged his sovereign to make himself independent of Napoleon, and to raise the standard of liberty and independence in Italy. Murat was supported by the Carbonari (who desired a constitution) only during the short intervals in which it was hoped that he would act according to these suggestions. In the sequel he informed his brother-in-law Napoleon of the designs of Maghella, and delivered him, as a native Genoese, to France, where he lived for some time under the superintendence of the police. In 1815 he returned to Italy, and exerted his influence chiefly in the States of the Church, then occupied by Murat. After the expulsion of Murat by the Austrian armies he was first carried to a Hungarian fortress, afterwards delivered to the King of Sardinia, imprisoned for a year in Fenestrelles, and then set at liberty. The ritual of the Carbonari was taken from the trade of the charcoal burner. Clearing the wood of wolves (opposition to tyranny) was the symbolic expression of their aim. By this they are said to have meant at first only deliverance from foreign dominion; but in later times democratical and anti-monarchical principles sprang up, which were probably discussed chiefly among the higher degrees of the order. They called one another *good cousins*. Those of the second degree were called *Pythagoreans*, and the oath of admission was 'Hatred to all tyrants!' Of the third degree, whose existence cannot be doubted, little is known. There are even traces of a fourth degree. A general union of the order under a common head seems not to have been effected. The separate societies in the small towns entered into a connection with each other; but this union extended no further than the province. The place of assembly was called the *hut* (*barraca*); the surrounding neighbourhood was called the *wood*; the meeting itself was distinguished as the *sale* (*vendita*). The confederation of all the huts of the province was called the *republic*, generally bearing the ancient name of the province; for instance, the *Republic* of *West Lucania*, in Principato Citra, which consisted of 182 huts, and had its seat at Salerno; the *East Lucanian Republic*, in the province of Basilicata, chief seat at Potenza; the *republics* of *Hirpinia*, *Daunia*, &c. The chief huts (*alta vendita*) at Naples and at Salerno endeavoured to effect a general union of the order, at least for the kingdom; but the attempt appears to have been unsuccessful. To what degree, however, the feelings of the nation were prepared for the object appears from the fact, that the order, soon after its foundation, contained from 24,000 to 30,000 members, and increased so rapidly, that it spread through all Italy. In 1820, in the month of March alone, about 650,000 new members are said to have been admitted. Whole cities joined it; the little town Lanciano, in Abruzzo Citra, in March, 1814, contained 1200 armed members. The clergy and the military, in particular, seem to have thronged for admission. The religious character of the order appears from its statutes: 'Every *carbonaro* has the natural and inalienable right to worship the Almighty according to the dictates of his conscience.' Although the Carbonari and the freemasons agree in some of their forms, they are quite distinct societies. After the suppression of the Neapolitan and Piedmontese revolution in 1821, the Carbonari, throughout Italy, were declared guilty of high treason, and punished as such by the laws. Meantime societies of a similar kind had been formed in France, with which the Italian Carbonari amalgamated; and Paris became the head-quarters of Carbonarism. The organization took on more of a French character, and gradually alienated the sympathies of the Italian members, a number of whom dissolved connection with it, in order to form the party of 'Young Italy.' It is probable that the only Carbonari in Italy now are those discontented spirits who wish to establish a republican government.

CARBONATES. See Carbon.

CARBONIC ACID. See Carbon.

CARBONIC OXIDE. See Carbon.

CARBONIC SULPHIDE. See Sulphur.

CARBONIFEROUS, meaning generally anything which contains, or is productive of coal, might, as a geological term, be applied to a vast series of strata, commencing with the Devonian system, in the schists of which beds of anthracite are sometimes found, and extending upwards, not only into the oolite and chalk, where extensive beds of lignite are not uncommon, but to the turf beds resting on modern alluvium. More properly, however, geologists usually confine the carboniferous system or formation to the strata in which all the more important seams of true coal are found, and which may therefore be considered as commencing with the mountain limestone, and terminating with the trias, or new red sandstone. The total thickness has been estimated at about 3000 feet. In the mountain limestone—so called from the mountain masses which it sometimes forms, particularly in England—rich veins of lead are found; but the coal, though often in seams of considerable thickness, is generally of very inferior quality, and therefore seldom worked, except for inferior purposes, as the burning of lime, or in districts where the absence of better coal happens to give it a factitious value. Even this coal is generally confined to the upper part of the mountain limestone, and the true coal measures are not found till in ascending both it and a very coarse sandstone, sometimes quarried for millstones, and hence known by the name of millstone grit, are passed. The strata containing workable coal contain it in numerous seams, of greater or less thickness, alternating with sandstones, shales, and limestones. Many of the shales abound with ironstone balls, from which several of the great ironworks of England have long derived their chief supplies; and not unfrequently seams of ironstone, varying in thickness from a few inches to 1 or 2 feet, occur, either closely united to the coal or in its immediate vicinity. In this way the most important metal in the arts has been providentially placed in juxtaposition with the fuel necessary for smelting it. In general, the deposits of coal have been made in basins of a circular or oval form, and in some coalfields the original shape of the basin is easily traced. More frequently, however, only one side remains entire, and a kind of trough has been formed, in which the strata, though they must at first have been horizontal, are more or less inclined, and exhibit numerous instances of violent dislocation, by which the same seam is thrown out of its natural level, and carried up or down for many hundred feet. These dislocations often prove serious obstacles to miners; but they also compensate for the mischiefs they occasion by bringing up seams towards the surface, and thus making the working of them practicable, when otherwise the angle at which they dip must soon have carried them altogether out of reach. The most remarkable feature in the carboniferous formation is the exuberance of its vegetation. The plants, most of which are allied to ferns, reeds, palms, and pines, are very different from the species now existing, and even when they resemble them, seem to indicate that the climate in which they grew must have been warmer than at present. This peculiar character prevails in whatever region of the globe coal is found, and is as visible in the seams of Greenland and Melville Island as in those of the now torrid zone. Fishes also are very numerous, especially those of the ganoid class. See Geology.

CARBUNCLE. See Garnet.

CARBUNCLE, in surgery, consists of a circumscribed inflammation of the skin and underlying tissue. It usually begins as a small pimple, with a hard and red base. From the first there is a hot, stinging, and throbbing pain out of proportion to the apparent gravity of the disease. The inflamed base rapidly swells from the effusion of lymph into the cellular tissue, and a hard and painful lump is the result. The swelling is of a dusky red hue. As this increases in size the skin gives way at several points, from which gray sloughs and a scanty purulent discharge issue. A carbuncle varies from 1 to 6 inches in diameter. Carbuncles generally occur in low states of the system, and always indicate a condition of lowered vitality. They are more common in old than young people. With regard to the local treatment, the principal thing to be done is to make a free incision into the tumour by cutting across it with the knife; as much of the contents as possible should then be pressed out, and a poultice applied. An emollient poultice should also be applied before the incision is made; and during the progress of the disease the patient's strength should be supported by nourishing and easily digested food, and tonics and cordials should be administered.

CARCAGENTE, or Carcaxente, a town, Spain, province Valencia, and 28 miles s. by w. of the town of that name, in a fertile and beautiful plain, on the right bank of the Jucar. The houses are well built and spacious, forming wide and clean streets. The principal square is large, lined with handsome dwellings and shops, and contains a spacious and elegant modern townhouse and prison. There are likewise a parish church, several chapels, two convents, an hospital, almshouse, cemetery, some primary schools, and an extensive palace of the Marquis of Calzada. In the environs are delightful promenades and gardens. Trade in grain, fruits, and silk. Pop. 12,102.

CARCASS (French, *carcasse*), in military language an iron spherical case filled with combustible materials, which is discharged from a mortar, howitzer, or gun. It does not burst, but has three fuse holes through which the flame rushes, firing everything within its influence. Carcasses are of considerable use in bombardments for setting fire to buildings, vessels lying in harbours, &c. They will continue to burn for eight or ten minutes, and are not even extinguished by water.

CARCASSONNE, the capital of the department Aude, France, on both sides of the Aude and a branch of the Canal du Midi, 53 miles s. of Toulouse. It consists of an old and a new town, which communicate by a bridge of twelve arches spanning the river. The old town is surrounded by a double wall, part of it so ancient as to be attributed to the Visigoths, and is defended by a castle. Its streets are narrow, dirty, and desolate, forming a striking contrast to those of the new town, which is regularly built, and has many handsome modern houses. The church of St. Lazarus, formerly the cathedral, contains the tomb of Simon de Montfort, who led the infamous crusades against the Albigenses. The modern cathedral has little architectural merit. The boulevards are finely planted. The staple manufacture is woollen cloth which employs many persons, and is exported chiefly to the Levant, the Barbary States, and South America. The trade is chiefly in this cloth, and in wine, grain, brandy, fruit, and leather. Pop. (1896), 23,770.

CARD. Playing-cards are probably an invention of the East, and some assert that the Arabs or Saracens learned the use of cards from the Gipsies, and spread them in Europe. The course that card-playing took in its diffusion through Europe shows that it must have come from the East, for it was found in the eastern and southern countries before it was in the western. The historical traces of the use of cards are found earliest in Italy, then in Germany, France, and Spain. The first cards were painted, and the Italian cards of 1299 are acknowledged to have been so. The art of printing cards was discovered by the Germans between 1350 and 1360. The Germans have, moreover, made many changes in cards, both in the figures and the names. The *lanzknechtsspiel*, which is regarded as the first German game with cards, is a German invention. Of this game we find an imitation in France in 1392, under the name of *lansquenet*, which continued to be played there till the time of Molière and Regnard, and perhaps still longer. The first certain trace of card-playing in France occurs in the year 1361, and Charles VI. is said to have amused himself with it during his sickness at the end of the fourteenth century. The modern figures are said to have been invented in France between 1430 and 1461. It has been said that cards were known in Spain as early as 1332; but what is certain is that card-playing must have become prevalent in the course of the century, seeing it was prohibited by the King of Castile, John I., in 1387. Mr. De la Rue, the most extensive manufacturer of cards in England, obtained in 1832 a patent for various improvements in manufacture. The figures on cards had been generally produced by the outlines first being printed from copper plates, and the colours then filled in by stencilling. Mr. De la Rue's process was to print them from coloured types or blocks exactly in the same way as calico-printing, but all the colours being in oil. One of the best works on the different games at cards is the well-known treatise of Hoyle. For the different games see the respective articles.

CARDAMOM, Small (*Cardamomum minus; Amomum cardamomum*, Linnæus), a perennial plant growing in the East Indies. The fruit is used as a stimulant and aromatic. Triangular capsules, from 4 to 5 lines in length, contain the seeds, which are of a brown colour, a pleasant, aromatic smell, a warm, pepper-like taste.—The *great* and *middle cardamoms* are furnished by other species of Amomum, believed to be only varieties of the preceding. Their properties are not so energetic. Grains of paradise, used to give a pungent flavour to spirituous liquors, are produced by a species of Amomum.

CARDAN, or Cardano, Geronimo (*Hieronymus Cardanus*). This famous philosopher, physician, and mathematician, was born in 1501 at Pavia, and was educated from his fourth year very carefully in the house of his father, a lawyer in Milan, distinguished for his learning and integrity. In his twentieth year he went to Pavia to complete his studies, and after two years he began to explain Euclid. He was subsequently professor of mathematics and medicine in Milan (1534). He then returned to Pavia, again visited Milan, taught for some time at Bologna, and, meeting with some difficulties there, went to Rome. Here he was received into the medical college, and was allowed a pension by the pope. He declined the invitations of the King of Denmark, on account of the climate and of the religion of that country. The latter reason for his refusal appears strange from a man who was accused of irreligion; but his biographers differ with regard to his religious opinions. Contradictory passages are cited from his works, which cannot surprise us in one who was lost in cabalistic dreams and paradoxes, and pretended to have a familiar demon from whom he received warnings, &c. All this excited the theologians against him, who even accused him of Atheism, but certainly without foundation. The truth is that Cardan was superstitious, but his chimeras were in opposition to the superstitions of the age. He believed so implicitly in astrology that he drew his own horoscope several times, and ascribed the falsehood of his predictions, not to the uncertainty of the art, but to his own ignorance. His two works, De Subtilitate and De Rerum Varietate, contain the whole of his natural philosophy and metaphysics, and are curious as an instance of a strange mixture of wisdom and folly. Cardan wrote also on medicine. His writings on this subject, amid much trash, contain some sound ideas. His fame as a physician was so great, that the Primate of Scotland, who had been sick for ten years, and had consulted without success the physicians of the King of France and of the Emperor of Germany, invited him to Scotland, and was restored to health by his prescriptions. His highest claims to the gratitude of the learned rest on his mathematical discoveries. Algebra, which from the time of its origin had been cultivated almost exclusively in Italy, excited at that time much rivalry among the mathematicians, who carefully kept their discoveries secret in order to triumph over each other in their public disputes. Cardan, it is said, was told that Tartaglia had discovered the solution of equations of the third degree, and obtained the secret from him by stratagem and under promise of silence, but published the method in 1545, in his Ars Magna. The honour of giving his name to the invention has remained to him who first made it known, and it is still called the *formula of Cardan*. It is universally believed that Cardan discovered some new cases, which were not comprehended in the rule of Tartaglia; that he discovered the multiplicity of the roots of the higher equations, and finally the existence of negative roots, the use of which he did not, however, understand. His tranquillity was disturbed, not only by the attacks of his enemies, but also by his own extravagances, which are related in his work De Vita Propria, no doubt with much exaggeration. He died, probably, in 1576, according to some accounts by voluntary starvation, that he might not survive the year in which he had predicted that his death would occur. All his works, to the number of more than fifty, are contained in the edition of Lyons (1663, in ten vols. folio).

CARDI, Lodovico, surnamed *Civoli*, or *Cigoli*, a distinguished painter and architect, born at Empoli, or according to others Cigoli, in 1559, studied painting under Allori and S. di Titi, and afterwards formed his style on the works of Andrea del Sarto and Correggio, but more especially on the noble and spirited productions of Baroccio at Florence. His architectural works, in which he followed Michael Angelo, possess considerable merit. His contemporaries, and more especially the popes and grand-dukes of Tuscany, held him in high esteem. His most celebrated picture is the Lame Man Cured, which is in the church of St. Peter at Rome. After he had completed the first draught of it a rival artist surreptitiously made a drawing of it, engraved it in copper, and then charged Cardi with plagiarism. Cardi, without hesitation, abandoned the first sketch and began anew on a totally different plan. Sacchi considers it entitled to hold the first place among the pictures in Rome, after the Transfiguration of Raphael, and the St. Jerome of Domenichino. His Martyrdom of St. Stephen, executed for the convent of Monte Domini, and his Tobias entertaining the Angel, now in the Hermitage at St. Petersburg, are also noble paintings. He died in 1613.

CARDIFF (Welsh, *Caerdydd*, *Caer-dyv*, the fortress or city on the Taff), a municipal and parliamentary borough and seaport, the capital of Glamorgan, and largest town of Wales, is situated on the Taff, a mile and a half from its mouth in the estuary of the Severn, 170 miles west of London. The castle, situated on the north side of the town, was commenced by Iestyn ap Gwrgan, the last Welsh prince, in the year 1080, and finished by Robert Fitzhamon, a kinsman of William the Conqueror, in 1110. In 1648 Cardiff Castle was besieged by Cromwell, who bombarded it for three successive days. It is at present a residence of the Marquis of Bute. The town of Cardiff, as the outlet for the mineral fields of South Wales, has grown up with immense rapidity. As regards tonnage entered and cleared it is now the third port in the United Kingdom, and in respect of coal exported it is now the first. Among the public buildings, besides the parish churches, are included several places of worship belonging to the Baptists, Methodists, Independents, Roman Catholics, &c., a university college (for South Wales and Monmouthshire), established 1883, town-hall, market-hall, custom-house, law-courts, militia barracks, theatre, county jail, literary and scientific institution, free library, and museum; a number of national, British, parochial, and other schools; an infirmary, almshouses, dispensary, &c. The streets of the town have been recently improved by the corporation, and a water supply brought from the Brecknockshire Beacons. The docks are extensive and well constructed, and further improvements to the port, including a new dock, tidal harbour, low-water pier, &c., have been lately carried out. The area of the docks is now about 200 acres, these having been constructed by the Marquis of Bute at a cost of nearly £4,000,000. A great increase to the shipping accommodation was made by the Barry Dock, about 80 acres in extent, opened in 1888. Iron ship-building is carried on, and there are iron and other works on a large scale. In 1897 the number of ships cleared was 15,709, of 9,088,118 tons; in 1900, 14,437, of 9,331,344. The town (with Cowbridge and Llantrissant) returns one member to the House of Commons. Pop. in 1861, 32,954; in 1891, mun. bor., 128,915; parl. bor., 132,229; in 1901, mun. and county bor., 164,420; parl. bor., 167,679.

CARDIGAN, a maritime county of Wales, having Cardigan Bay on the west, and on the land side chiefly Carmarthen, Brecknock, Radnor, and Montgomery; area, 443,387 acres. The surface of the northern and eastern parts is mountainous, but interspersed with fertile valleys; while the southern and western districts are more level. Plinlimmon (2460 feet) is in the north-east. The soil in the vales is chiefly peat, capable of growing either grain or grass, by the application of lime; the higher grounds consist of a light sandy loam, and the mountains are composed chiefly of clay-slate. The agricultural produce of this county is comparatively small, but of late years has shown a tendency to increase; cattle, sheep—more valuable from their flesh than their fleece,—and wool are the staple commodities; the chief crops are barley and oats, very little wheat being grown. The total acreage under crops, bare fallow, and grass amounts to about 270,000 acres. The county is rich in metalliferous lodes, the lead-mines still yielding largely; zinc is obtained in several places; copper is not now found in its former abundance. Cardiganshire has an extensive coast-line, and many of the male population are sailors and fishermen. The principal towns are, the borough and county-town of Cardigan, Aberystwith, Lampeter, Tregaron, and Aberaeron. There are no manufactures of any importance. The county returns one member to Parliament. Pop. in 1871, 73,488; in 1891, 62,596; in 1901, 60,237.

CARDIGAN, a seaport town, municipal and formerly a parl. borough, Wales, capital of Cardiganshire, on both banks of the Teifi, here crossed by an ancient stone bridge of five arches, about 3 miles from its embouchure in St. George's Channel, 200 miles W.N.W. of London. The most noteworthy buildings are St. Mary's Church, a venerable structure upwards of 200 years old, having windows in the florid pointed style; several dissenting chapels, all of which are fine edifices, the shire-hall, Cardigan county school, the national and board schools, &c. The old county jail has been sold and converted into a number of fine villas. Cardigan Castle, famous in Welsh history, stands at the foot of an eminence near the bridge; two circular bastions are all that now remains of it. Of late years business has greatly revived in the town, and it is now a resort of many summer visitors. Brick, tile, and pottery works have been started, and two iron-foundries are actively employed, chiefly in the manufacture of agricultural implements. The harbour is obstructed by a bar, which renders the entrance dangerous in rough weather. In spring-tides vessels of 300 to 400 tons can come up the river, but the general trade is confined to vessels of 40 to 200 tons. The salmon fishery is extensively carried on in the neighbourhood, and many of the male population are engaged in the mercantile navy. Cardigan, with Aberystwith, Lampeter, and Adpar, formerly returned one member to Parliament. Pop. in 1901, 3511.

CARDINAL, a clergyman of the Roman Catholic Church who belongs to the body that elects the pope. The cardinals are next in dignity to the pope, whose councillors they are, enjoy the rank of princes, and since 1631 have borne the title of *eminence*. The origin of the dignity of cardinals is uncertain. The name is derived from *cardinalis* (distinguished). The same name was given under the Emperor Theodosius to the highest civil officers in the state. Till the eleventh century the term cardinal was common to all clergymen who regularly officiated in any church. From this time the popes, having grown powerful, formed a college, a secret council of ecclesiastics of high rank, to whom alone the title of cardinal was soon reserved, by way of eminence; and under Nicolas II., in 1059, they first obtained the exclusive right of choosing the pope, with much opposition, however, on the part of the other Roman clergy, and much scandal. Innocent IV. (1243-1254) gave them a rank above the bishops, together with the red hat, and Boniface VIII. assigned to them the princely mantle. Urban VIII. gave them the title *eminence* instead of *most illustrious*, which they had enjoyed till then. With the pope they form the sacred college, and are divided into three ranks—fourteen cardinal deacons, fifty cardinal priests, and six cardinal bishops, who take their names from the ancient bishoprics, Ostia (to which is added that of St. Rufino), Porto, Sabina, Palestrina, Frascati, and Albano. In 1586 their number was fixed at seventy by Sixtus V.; but it is by no means necessary that this number should be always full. The number of bishops only is always complete. The choice of the cardinals depends solely on the pope. He causes the names of those appointed to be read in the consistory, with the formula '*Fratres habebitis*' ('Ye shall receive as brethren, &c.) The red cardinal's hat is sent to those elected to inform them of their election. Their dress consists of a surplice, with a short purple mantle, and a small cap, over which they wear a hat, with silk strings and tassels at the end. The colour is either red or violet. The prerogatives of cardinals in different countries are different. A cardinal sent to a prince in a diplomatic character from the pope is called *legatus a latere* or *de latere*. A province, the governor of which is a cardinal, takes the title of a *legation*. The income of the cardinals is at present small compared to that of some of the rich clergy in England. The importance and authority of the cardinals has, of course, sunk very much in modern times, like those of the other dignitaries of the Catholic Church, the pope himself included. Formerly they preceded the princes of the blood, sat at the right of kings, on or near the throne, and were considered equal to kings in rank. For the manner in which they choose the pope see CONCLAVE.

CARDINAL BIRD, SCARLET GROSBEAK, &c., a beautiful American bird, belonging to the grosbeak family, a sub-division of the finches. It is about 8 inches in length, and the male bird has the back of a dusky red colour, and all the rest of the plumage bright scarlet, except that the chin, forehead, and base of the beak are clothed with jetty black feathers. The female is rather smaller, and has the upper parts of the body brownish olive, the tail and wings scarlet, the chin and forehead ashen gray, the breast and abdomen drab tinged with red. Both birds have the bill scarlet, and both are furnished with a crest of feathers which can be raised or lowered at pleasure. The song of the cardinal bird is so fine as to have earned it the name of the Virginian nightingale. It is most common in the southern parts of the United States, where it is sometimes migratory, sometimes a permanent resident. The food of the cardinal bird consists to a large extent of Indian-corn, but the seeds of apples, cherries, and of various other fruits are also eaten by them. Cardinal birds are now common in aviaries in this country, the climate of which they stand very well. The cardinal bird is by some made the type of a genus *Cardinalis*, to which the specific name *Virginianus* is added.

CARDINAL POINTS, the four intersections of the horizon with the meridian and the prime vertical circle. They coincide with the four cardinal regions of the heavens, and are, of course, 90° distant from each other. The intermediate points are called *collateral points*.

CARDINAL VIRTUES, or PRINCIPAL VIRTUES, in morals a name applied to those virtues to which all the rest are subordinate, or which comprehend all the others. The distribution of the virtues, which lies at the foundation of this notion, had its origin in the old Grecian philosophy; and the same number is found here as in the elements of nature. These principal virtues, as enumerated by Plato, are prudence, temperance, fortitude, and justice. The three first seem to relate to the duties of man towards himself, and to correspond with the triple division of the soul into the intellectual, the irrational (the seat of the sensual desires), and the seat of the affections, which connects the two first. Justice either relates to our duties to others (God and men), or is the union of the three first virtues. This division appears to be peculiar to the old Pythagoreans. Aristotle divided them still further. The Stoics, too, made the same division in their system of morals, and Cicero introduced it into his work De Officiis. Plotinus and many New Platonists divide the virtues into four classes—civil or political, philosophical or purifying, religious, and lastly, divine or pattern virtues: a division coinciding with the rest of his philosophical views. The influence of the ancient philosophers has made the preceding cardinal virtues also a part of the Christian code. Some add to them the three *Christian virtues* so called—faith, charity, and hope—and call the former *philosophical*. The imagination of artists has represented the cardinal virtues under sensible images. In modern times this division is regarded as useless in treating of ethics.

CARDING, the process wool, cotton, flax, &c., undergo previous to spinning, to lay the fibres all in one direction, and remove all foreign substances. The card was formerly a number of iron teeth arranged in a piece of leather of various lengths, and the wool, &c., was combed by the hand. Now the process is done by machinery, the cards being fine long teeth, arranged on a series of cylinders so placed that the material is carried from the one to the other.

CARDOON (*Cynara cardunculus*), a plant of the same genus as the artichoke—which it much resembles—and introduced into this country from Candia about a century after the latter. Its cultivation has never been an object of much attention in Britain, where it is considered of little value. On the Continent it is much more extensively used. The stems of the young leaves, rendered mild and crisp by blanching, are the only edible portion of the plant. They are prepared in various ways.

CARDS, PLAYING. See CARD.

CARDUUS (*thistle*), a genus of plants which belong to the natural order Compositæ. They are almost all troublesome weeds, though some foreign thistles are said to possess medical properties which make them useful in fevers. The most common in this country are the *Carduus* (or *Cnicus*) *arvensis* (corn-thistle, way-thistle, or creeping-thistle), which has strong fleshy roots extending underground, and difficult of extirpation; and *C. lanceolatus* (spear-thistle), which, both from its size and rough feeding, is a great robber of the soil, but from being only a biennial is more easily managed. *C. lanceolatus* appears to be the Scotch heraldic thistle, though this is more usually identified with the *Onopordum acanthium*, or great cotton-thistle.

CAREENING (in French *caréner*, from Latin *carina*, a keel), the process of heaving a vessel down on one side by applying a strong purchase to the masts, so that the bottom may be cleansed by breaming, that is removing by means of fire any growth which adheres to it, or any other necessary work effected. A *half careen* may take place when it is not possible to come at the bottom of the whole ship. Very few ships are now careened, more especially since the introduction of copper sheathing.

CAREW, THOMAS, an English poet, supposed to have been born in 1589, was educated at Corpus Christi College, Oxford. Cultivating polite literature in the midst of a life of affluence and gayety, he was the subject of much eulogy by Ben Jonson, Davenant, and other writers of the period. He seems to have died in 1639, having in the meantime exhibited the not unusual transformation of the courtly and libertine fine gentleman into the repentant devotee. Carew is coupled with Waller as one of the improvers of English versification. The first collection of his poems was printed in 1640, 12mo; the last in 1824. His elegant masque of Cœlum Britannicum was printed both in the early editions and separately in 1651, and the whole are now included in Chalmers' British Poets. Carew was much studied by Pope; and Dr. Percy also assisted to restore him to a portion of the favour with which he has lately been regarded. Specimens both of the sublime and the pathetic may be found in his works; the former in his admirable masque, and the latter in his epitaph on Lady Mary Villiers.

CAREX, a genus of plants, belonging to the natural order of Cyperaceæ or sedges, and containing numerous species, which are found in all parts of the world where vegetation can exist, on the driest moor as well as the wettest marsh. The plants are perennial, often creeping, with sharp, keeled leaves, and solid, triangular stems. The flowers are without perianth and unisexual, being grouped in spikelets. The male flowers have usually three stamens, the females having a single style with three stigmas. The number of known species is about 450, and of these Great Britain has nearly seventy. Almost none of them are of any agricultural value, but *C. arenaria*, the sand-sedge, is of use in binding the sand on many sea-shores. *C. japonica variegata* is an elegant variety cultivated by florists.

CAREY, Henry, composer and poet, born at London in 1696, was a natural son of George Saville, Marquis of Halifax. His first instructor in music was a German, named Linnert, but he was afterwards more thoroughly trained under Roseingrave and Geminiani. He was inexhaustible in the invention of new, pleasing, and often deeply pathetic melodies, to which he not unfrequently furnished the words. His Sally in our Alley is still a well-known song. He has also been said to be the author of God Save the King, but this appears to be erroneous. He supported himself by public and private teaching, but his whole life was a continued struggle with poverty, and it has been said that at last, in a fit of despair, he committed suicide (1743). His collected songs were published in 1740. Among other works are Teraminta (1732) and other operas; Chrononhotonthologos, 'the most tragical tragedy ever yet tragedized' (1734), a burlesque; The Wonder, or An Honest Yorkshireman (1735); and The Dragon of Wantley (1737). His dramatic works were published together in 1743.

CAREY, William, a distinguished oriental scholar and Christian missionary, the son of a village schoolmaster, was born on Aug. 17, 1761, at Paulerspury, Northamptonshire. He was early apprenticed to a shoemaker, and continued to work at this trade till his twenty-fourth year; but his natural turn for languages, and his zeal for the spread of the gospel, were too strong to be overcome. With the little assistance he could procure he acquired Latin, Greek, and Hebrew, and likewise studied theology. In 1786 he became pastor of a Baptist congregation at Moulton, and in 1787 was appointed to a similar situation in Leicester. In 1793 he sailed for the East Indies as a Baptist missionary; but fearing, from his possessing no authorized status, that the East India Company might not sanction his residence, he remained at some distance from Calcutta, and accepted the appointment of overseer to an indigo factory, and continued to hold it till 1800. During his spare hours he studied languages and natural history, and collected a rich store of oriental knowledge. In 1800, in conjunction with Marshman, Ward, and others, he founded the missionary college at Serampore; the year following he became professor of Sanskrit, Bengali, and Mahratta at the newly-erected college of Fort William. In Serampore he had a printing-press for more than forty different Indian languages, and issued various translations of the Scriptures. His first work was a Mahratta Grammar. It was followed by other works, including a Bengali Lexicon, in which he was assisted by Felix Carey, his son. Under his direction the whole Bible was translated into six, and the New Testament into twenty-one languages or dialects of Hindustan; and considerable progress was made with the translation of the whole Scriptures into Chinese, though his labours in regard to this language were afterwards, in a great measure, superseded by those of Dr. Morrison. One of the English universities conferred on him the degree of D.D., and the Asiatic societies of London, Paris, Calcutta, &c., admitted him into their body. Besides the works already mentioned, he edited Shroeder's Lexicon of the Thibetan language, and also Roxburgh's Flora Indica, in which a genus of plants which he discovered is named after him *Careya*. He, moreover, established an agricultural society at Calcutta, and a botanical garden, at his own expense, at Serampore. His general philanthropy was particularly manifested in his endeavours to suppress infanticide and suttees among the Hindus. He died at Serampore on June 9, 1834. See his Life by Dr. G. Smith (1885). His son, Felix Carey, born in 1786, was the author of a Burmese Grammar, and translated several English works into Bengali, Sanskrit, and Burmese. He died in 1822.

CARGILL, Donald, a noted covenanting preacher, was born in the parish of Rattray, in Perthshire, about 1619; studied at Aberdeen and St. Andrews, and became minister of the Barony Church in Glasgow in 1655. On the establishment of Episcopacy at the Restoration he refused to accept collation from the archbishop, and was in consequence exiled beyond the Tay. From this time he led the life of a field-preacher; but it was not till latterly that he attracted the attention and persecution of the government. In 1679 he took part in the battle of Bothwell Bridge, where he was wounded, but succeeded in escaping to Holland. The following year he was again in Scotland, and is believed to have drawn up the celebrated Queensferry Declaration, which was found on the person of his friend, Mr. Hall of Haughhead. An attempt had been made to arrest Hall and Cargill in a public-house at South Queensferry, and in the struggle the former was killed, but Cargill escaped. He fled to the south, and on 22nd June, 1680, published, along with Richard Cameron, the equally-famed Sanquhar Declaration. In September of the same year, on the occasion of a field-preaching in the Torwood, between Falkirk and Stirling, he formally excommunicated King Charles II., the Duke of York, the Dukes of Monmouth and Lauderdale, the Earl of Rothes, Sir George Mackenzie, and Sir Thomas Dalzell of Binns. This provoked the implacable resentment of the privy-council, and a reward of 5000 merks was offered for his apprehension. After avoiding the vigilance of his pursuers for several months, he was at length, in May, 1681, captured at Covington Mill, Lanarkshire, and conveyed a prisoner to Lanark. From thence he was sent to Glasgow, and afterwards to Edinburgh, where, after being tried and sentenced, he suffered death for high treason, on 27th July.

CARIA, in ancient geography the country forming the S.W. corner of Asia Minor, bounded on the N. by Lydia or Mæonia, from which it was separated by the Mæander; on the E. by Phrygia, on the S.E. by Lycia, and on the S. and W. by the Mediterranean. Some confusion, however, exists in regard to its boundaries. Part of it was settled by Greek colonies of Ionians and Dorians, who dispossessed the original inhabitants. It was included in the dominions of Crœsus, king of Lydia, and on his overthrow by Cyrus was transferred to the Persian monarchy, under whose protection a dynasty of Carian princes was established. Halicarnassus was the residence of these sovereigns, among whom were the two celebrated queens, the first and second Artemisia. The progress of the Roman conquests ultimately extinguished the independence of Caria, and about B.C.

129 it was incorporated in the Roman province of Asia.

CARIACO, a seaport of Venezuela, in the state of Bermudez, situated to the E. of the Gulf of Cariaco, near the mouth of a river of the same name, adjoining a large plain, covered with plantations. The climate is very hot, the air damp and unhealthy. Its trade is chiefly in cotton and sugar. The Gulf of Cariaco is 38 miles long, from 5 to 10 broad, from 80 to 100 fathoms deep, surrounded by lofty mountains. Pop. 7000.

CARIBBEAN SEA, that portion of the North Atlantic Ocean lying between the Caribbee or Leeward and Windward Islands on the E., Mexico and Central America on the W., the islands of Hayti and Cuba on the N., and Colombia and Venezuela on the S. It communicates with the Gulf of Mexico by a passage of about 120 miles in width, between Cape Catoche, in Yucatan, and Cape St. Antonio, the most W. point of Cuba. Its S. shores are generally high and rocky, and contain some gulfs of considerable extent. Being but little encumbered with rocks or islands its navigation is, for the most part, clear and open.

CARIBBEE (or St. Lucia) BARK, a bark sometimes substituted for Cinchona (see Bark, Peruvian), though not containing its characteristic alkaloid. It is procured from the *Exostemma Caribæum*, a tree growing in the West Indies. This bark is in convex fragments, covered with a yellow epidermis, and has a very bitter taste and very faint smell.

CARIBBEES, or Lesser Antilles, usually divided into the Windward and Leeward Islands, a section of the West India Islands (which see).

CARIBOU, the name of two species of reindeer found in Canada. One of these, *Rangifer grœnlandicus*, known as the Barren Ground Caribou, inhabits the barren country in the north of British North America, extending also into Greenland. In colour it is reddish-brown above and white below in summer, but the winter coat is whiter and denser. It migrates northwards in summer, but on the approach of winter it travels south to the forest country. The other species, the Woodland Caribou (*R. caribou*), is larger, but has smaller and less branched horns. It inhabits the wooded country to the south of the places frequented by the above species. It is of a general dun-gray colour, and the height at the shoulder is about 3½ feet. It is rather shy, and its fleetness enables it readily to distance those in pursuit. Its food consists mainly of lichens, but other vegetable products are also eaten. The numbers of both species have been greatly diminished by hunting and other means.

CARIBS, the original inhabitants of the Caribbee Islands, and, when Europeans became acquainted with America, spread also over the whole N. coast of South America. The Caribs, being a bold and warlike race, made a stout resistance to the progress of European colonization. They were almost entirely expelled from the islands in the eighteenth century; but there are still some hundreds of pure Caribs in the island of Dominica. They mostly live by themselves in a secluded valley on the windward side of the island, occupying a sort of village, consisting of a collection of very poor huts. The men are said to be expert fishermen and boatmen. They do not engage in agriculture, and grow nothing but a few provisions. A peculiar kind of waterproof baskets is woven by them. There are also many pure Caribs in Guiana and the Orinoco region. On the island of St. Vincent there was formerly a mixed race called black Caribs, sprung from the intercourse of black slaves and Carib women. They long upheld the independence of their quarter of the island against all the efforts of the British, but were finally transferred to the island of Ruatan, in the Bay of Honduras, whence they crossed over to the neighbouring coast of Honduras. Their descendants are distinguished for intelligence, trustworthiness, and their excellence as labourers, and are much employed in mahogany cutting.

CARICA. See Papaw.

CARICATURE (from the Italian *caricare*, to load, to overcharge), an exaggerated representation of the qualities and peculiarities of an object, but in such a way that the likeness is preserved, or even made more striking. Considered in reference to the fine arts, external deformities which do not spring from the fault of the persons afflicted, and therefore excite compassion rather than disgust, can never be the proper subjects of caricature; for besides the moral sense being offended, the arts are not permitted to idealize deformities, unless for the purpose of embodying and representing character. Such corporeal disfigurements, however, as arise from moral defects, and all disagreeable peculiarities of manner and appearance which spring from the same cause, are fair subjects of caricature. Caricatures dealing with the vices and follies of individuals, or of whole classes, sects, &c., acquire interest from the moral views with which they are put forward by the painter, and understood by the spectator. With this object Leonardi da Vinci drew his caricatures. He represents the quarrelsome, the peevish, the braggart, the slothful, the bloated glutton, the dissipated rake, the awkward clown, the laughing fool, &c., all with fidelity, but with exaggeration. Caricatures were in use even among the ancients, who had among their masks a number of caricatures. Hogarth is an unrivalled master of caricature. The political caricatures of the English are of a striking and peculiar kind, often exhibiting a greater sensibility for political liberty than for dignity and beauty, but abounding in wit and bold humour. Gilray, Bunbury, Rowlandson, John Doyle, Richard Doyle, Leech, Cruikshank, and Tenniel may be considered as the chief masters in this kind of caricature.

CARIES, a disease of bone in which the substance of the bone melts down, as it were, into unhealthy matter, which works its way to the surface and bursts. As the ulceration continues there is a constant discharge of thin, ill-smelling matter through the opening that has been formed; the edges of the opening, too, are red and pouting, and a probe gives the sensation of softness and grittiness, the bone breaking down under the touch. Persons whose constitution is tainted with scrofula or syphilis are the most liable to this disease, the bones attacked being most commonly the short bones of the wrist and foot, the vertebræ, and the heads of long bones. Good food, tonics, change of air, and a general strengthening treatment are necessary; and often the diseased portions may be removed by a surgical operation.

CARIGNANO (ancient *Cariniacum*), a town of Italy, in the province of and 11 miles S. of Turin, on the left bank of the Po, here crossed by a wooden bridge. It is surrounded by old walls, and has a handsome square ornamented with arcades, some fine churches, some silk-spinning mills, and sugar-refineries. From this town is named a branch of the house of Savoy. Pop. (1881), 7151.

CARINI, a town of Italy, in the island of Sicily, in the province and 11 miles W.N.W. of Palermo, beautifully situated on a river of same name, near its mouth. It has a Gothic castle of the fourteenth century, with several churches. Fishing is the chief employment. The district produces much corn and wine. Pop. (1881), 12,037.

CARINTHIA (German, *Kärnthen*), a duchy or province of Austria, between lat. 46° 24′ and 47° 7′ N., and lon. 12° 35′ and 15° 10′ E., bounded N. by Salzburg and Styria, E. by Styria, S. by Carniola, and W. by Italy and Tyrol. Area, 3986 square miles. It is extremely mountainous, generally sterile, and one of the most thinly populated provinces of Austria. The arable land does not exceed 290,000 acres, but there are some fertile valleys, and a considerable extent of rich pasture land. It has several rivers and lakes. Of the former the principal is the Drave. All of them abound with fish. The country does not yield corn enough for the consumption of the inhabitants, who import the deficiency from Hungary. The cereals most extensively cultivated are rye and oats. Some wine is produced in Lower Carinthia, but it is of inferior quality. Cattle, sheep, and horses are raised in considerable numbers, but the mines of Carinthia are the main sources of its wealth. The chief of these are lead, iron, and calamine. Various kinds of gems are met with. Its operative industry is chiefly confined to the working of its metallic ores, though there are also manufactories of woollens, cottons, silk stuffs, &c., most of which are in Klagenfurt, the capital. The principal towns are Klagenfurt and Villach. The inhabitants are represented as indolent and superstitious, and are mostly Roman Catholics. Carinthia formed part of the empire of Charlemagne, and afterwards belonged to the Dukes of Friuli. It subsequently passed through various hands, and finally became an appendage of the Austrian crown in 1321. In 1809 it was annexed to the empire of Napoleon, but was restored to Austria in 1814. Pop. in 1890, 361,008.

CARISBROOKE, a village of England, in Hampshire, pleasantly situated at the foot of a hill, near the centre of the Isle of Wight, and overlooked by the ruins of its ancient castle, where Charles I. was imprisoned thirteen months, previous to his trial and execution. The castle and grounds cover 20 acres. The parish church of St. Mary is a venerable structure, with a fine Perpendicular tower containing a chime of bells. It was formerly attached to a Benedictine priory founded under William the Conqueror, but the priory no longer exists. In 1859 a Roman villa was discovered at Carisbrooke; and the place seems to have been a fortress at the time of the Roman occupation. Pop. of parish (1891), 9115.

CARISSIMI, GIACOMO, a famous Italian musical composer, was born at Marino, near Rome, in 1604, became musical director of the church of S. Apollinaris at Rome, and died there on Jan. 12, 1674. He wrote many oratorios, cantatas, and motets, and his contemporaries praised him for his characteristic expression of feeling, and his easy, flowing style. He deserves most honour for the improvement of the recitative, having given it a more expressive and natural language; and he greatly developed the sacred cantata. His oratorio Jonah has been revived in recent times. It anticipates in the descriptive passages some of the effects since elaborated by the modern classical composers, and it is altogether distinguished by freedom, boldness, and striking antiphonal imitations.

CARITÀ (Italian, from the Latin *caritas*, love), a name, in the fine arts, applied to the representation of Christian love. It is exhibited under the figure of a tender mother, in the midst of her children, manifesting her kindness and affection for them. This representation of loveliness and tenderness united was unknown to ancient art.

CARLÉN, EMILIE, Swedish novelist, was born at Strömstad on Aug. 8, 1807. In 1838 she published her first novel, Waldemar Klein, and among the best of her subsequent works are the Professor (1840); A Year (1846); The Brother's Bet; and The Guardian (1851). Several of her novels have been translated into English. In 1827 she married a physician named Flygare, and in 1841, after the death of her first husband, she married J. G. Carlén, a lawyer and poet. Her death took place at Stockholm on Feb. 5, 1892. In 1878 she published a volume of Reminiscences of Swedish Literary Life.

CARLETON, WILLIAM, one of the most popular of Irish novelists, was born in 1794, at Prillisk, in the county of Tyrone. Son of a peasant, he had to endure all the miseries of a poor Irishman's lot. His education commenced at a hedge-school, and terminated with two years' training in an academy at Glasslough. Thence he went to Dublin, with about three shillings in his pocket, and after a little began to support himself by private teaching. He also began writing for the Christian Examiner, and in 1830 he published his Traits and Stories of the Irish Peasantry. Popular tastes and critical judgment were both satisfied by the novelty of contents and freshness of style. A second series followed in 1833, and was as universally welcomed. We can only mention some of his subsequent efforts, in the order of publication: Fardorougha, the Miser (1839); The Misfortunes of Barney Branagan (1841); Valentine M'Clutchy (1845); The Black Prophet (1847); The Tithe Proctor (1849) Willy Reilly (1855); and The Evil Eye (1860). Ireland has found in Carleton a faithful and fearless exponent of her thoughts and feelings; but outsiders cannot help thinking him somewhat too much of a partisan. He enjoyed a government allowance of £200 per annum several years before his death, which took place on Jan. 30, 1869.

CARLI, GIOVANNI RINALDO, COUNT, Italian writer, was born in 1720 at Capo d'Istria, of an ancient noble family, and early manifested an inclination for the study of the middle ages, with which he connected the study of belles-lettres and of poetry. In his twenty-fourth year the senate of Venice made him professor of astronomy and naval science. The care which his large estates required compelled Carli to resign his professorship and retire to Istria, where he spent his time in the study of antiquities, on which he wrote some valuable treatises. He was afterwards appointed by the emperor president of the highest commercial court at Milan, and subsequently president of the college of finance in the same city. He published his works, 1784–94, in fifteen volumes, under the title Opere del Sig. Commendatore D. Gian. Rinaldo, Conte Carli, Presidente, &c., but this edition does not include his Delle Monete (1754–60), and Delle Antichità Italiche (1788–91). He died in 1795.

CARLINE-THISTLE, the popular name for composite plants of the genus *Carlina*, closely allied to the true thistles (*Carduus* and *Cnicus*). The only British species is *C. vulgaris*, often found on dry fields and pastures. It has purple heads, and the inner bracts of the involucre are straw-coloured and very hygrometric, opening out in dry, and closing up in wet weather.

CARLISLE, a city, parliamentary and municipal borough, inland port and market town of England, and capital of Cumberland, situated 300 miles N.N.W. from London and 96 S. from Edinburgh. It occupies a gentle eminence at the confluence of the Eden, Caldew, and Peteril, a short distance S.E. of the point where the great Roman wall crossed the first two rivers. It was called by the Romans *Luguvallum*, which, contracted to *Luel*, and added to the word *Caer*, city, produced the modern name, signifying the city near the wall. Being a frontier town, it was strongly fortified with walls, citadel, and a castle, the latter being founded during the reign of William Rufus. The walls had three gates, named English, Irish, and Scottish gates, and inclosed a triangular site. The W. wall was 1000 yards in length, the eastern wall 460 yards, and the northern wall 650 yards. In the various improvements of the city all these walls, gates, and fortifications have been removed, except a portion of the W. wall, and the castle, which was erected by William Rufus. Till quite recently the castle was maintained as a garrison, with a governor, lieutenant-governor, store-keeper, and other stationary officers. Carlisle is celebrated in border history, and in the wars between England and Scotland. It was destroyed by the Danes in 875; from which time it lay in a state of desolation until fortified and improved by William Rufus. David I., king of Scotland, died here in 1153, after his retreat from the battle of the Standard, and in 1216 it was taken by Alexander, king of Scotland. It was repeatedly besieged by the Scots, but never retaken until 1645, when a party of the Scottish army on the side of Parliament starved it into surrender. It was in 1648 surprised and captured by Sir Philip Musgrave, a royalist, but ultimately yielded to the skill and fortune of Cromwell. In 1745 it made little more than a nominal resistance to the Scottish army under Charles Edward. The town is somewhat irregularly built, but its principal streets are spacious and well-paved. A number of the modern houses are handsome, and, being built on a plan, are gradually imparting an appearance of uniformity to the city. Carlisle is the seat of a bishopric founded by Henry I. in 1133. The cathedral, which is situated on elevated ground near the centre of the town, is one of the principal objects of interest. It was founded by William Rufus, but being afterwards partially destroyed by fire was rebuilt in the beginning of the fourteenth century. It is a small but beautiful edifice, affording specimens of early English and other styles. The eastern window, which is 48 feet high by 30 broad, and filled with painted glass, is one of the finest specimens of the kind in England. The castle, of interest from its historical associations, is situated on a slight eminence overlooking the Eden, at the N.W. angle of the city. Among the literary and educational institutions are the athenæum, mechanics' institute, grammar-school, public library, museum and art gallery, science and art and technical schools. The charitable institutions are numerous, and include an infirmary, fever hospital, lunatic asylum, and dispensary. There is a cattle-market and also a public market erected at a cost of £50,000. The buildings appropriated to corporate purposes are the town-hall and guild-hall. The courts of justice and the county jail, at the southern entrance of the city, were designed by R. Smirke, R.A., and cost over £100,000. Many of the public edifices are handsome. Carlisle is the seat of various manufactures, of which cotton is the principal, embracing the weaving of checks and ginghams, calico-printing, and the manufacture of cotton-twist. The making of hats is also carried on to a large extent. Carlisle has long been famed for its manufacture of whips and fish-hooks; there are, besides, two woollen manufactories, several dye-works, tanneries, iron-foundries, breweries, marble-works, and an extensive biscuit manufactory. Carlisle was formerly connected by canal with Port-Carlisle, on the Solway Firth, a distance of about 11 miles; but this canal is replaced by a railway to Port-Carlisle which is extended to Silloth, where an extensive dock has been constructed. Communicating in this way with the sea, it is still classed as a port. Vessels entered (1898), 697, of 121,778 tons; cleared 694, of 120,251. The Citadel station, situated not far from the courts, is one of the handsomest in the kingdom. It is built of white stone in the early English style, and is supported by buttresses at intervals along its entire length, and is roofed with glass. It is the terminus of seven different lines of railway, viz. the Caledonian, the Glasgow and South-Western, the London and North-Western, the Midland, the North-Eastern, the North British, and the Maryport and Carlisle. Carlisle sends one member to Parliament. Pop. (1881), 35,884; (1891), 39,176; (1901), 45,478.

CARLISLE, a town of the United States, capital of Cumberland county, Pennsylvania, 114 miles W. Philadelphia. Dickinson College was founded in this town in 1783, and is carried on under the care of the Methodists. There are government barracks here. Pop. in 1890, 7620.

CARLISTS, the name of an important Spanish political party. See CARLOS DE BOURBON.

CARLONE, the name of an Italian family of distinguished artists, who flourished chiefly in the seventeenth and eighteenth centuries. The most celebrated of them are:—1. TADDEO, a native of Lombardy, who excelled in sculpture, and was employed, along with his brother Joseph, by the courts of England, Spain, and Mantua. He died in 1613.——2. GIOVANNI, eldest son of Taddeo, born at Genoa in 1590, made great progress in painting under the tuition of his father and Peter Sorri, and, having afterwards studied under Passignano, distinguished himself particularly by his frescoes, in which the freedom and spirit of his design, the depth of his expression, grandeur of his conception, and the richness of his colouring are particularly admired. He died in 1630.——3. GIOVANNI BATTISTA, brother of the former, born at Genoa in 1598, was also a scholar of Passignano, and painted along with his brother, whose style he followed so exactly that it is difficult to distinguish their pictures. He ultimately entered the service of the Duke of Savoy, and died in 1659, or 1680 according to another authority. He excelled particularly in frescoes, which are so soft, fresh, and uniform that they resemble oil paintings.——4. ANDREA, son of Giovanni Battista, born in 1627, died in 1697, rose to great eminence as a painter. He took chiefly for his models Titian, Veronese, and Tintoretto, and founded a school of painting in Perugia.

CARLOS, DON, Infant of Spain, son of Philip II. and Maria of Portugal, born at Valladolid, 1545. His mother died four days after his birth. He himself was sickly, and one of his legs was shorter than the other. The extreme indulgence with which he was educated by Joan, sister of the king, confirmed his violent, obstinate, and vindictive disposition. In 1560 Philip caused him to be acknowledged heir of the throne by the estates assembled at Toledo, and in 1562 he sent him to the University of Alcala de Henares in hopes that the study of the sciences would soften his turbulent character. An unlucky fall threw him into a burning fever, and the physicians lost all hopes of his recovery. The king immediately hastened to his son, and as it was recollected that the prince had a very great veneration for St. Didacius, who was not yet canonized, Philip commanded the corpse of the saint to be brought in a procession. It was laid upon the bed of the sick prince, and his hot face covered with the cold shroud. He fell asleep; when he awoke the fever had left him; he demanded food, and recovered. All believed a miracle had been wrought, and Philip requested the canonization of Didacius. Contemporary historians differ in the description of the prince. According to some he had a thirst for glory, an elevated courage, pride, and a love of power. According to others he was fond of whatever was strange and uncommon; an accident or opposition irritated him to frenzy; address and submission softened him. He is also represented as a favourer of the insurgents in the Netherlands, and in particular as an enemy of the Inquisition; yet he possessed neither knowledge nor principles, nor even sufficient understanding to be capable of liberal views. With him all was passionate excitement, which resistance converted into fury. Llorente has corrected the accounts of the character and fate of this prince from authentic sources in his work on the Spanish Inquisition (which see). According to him Don Carlos was arrogant, brutal, ignorant, and ill-educated. This much is certain, that at the Congress of Cateau Cambrésis (1559) the marriage of Don Carlos with Elizabeth, daughter of Henry II. of France, was proposed; but Philip, being left a widower by the death of Mary of England, took the place of his son. Don Carlos is said to have loved Elizabeth, and to have never forgiven his father for having deprived him of her. Llorente proves, however, that Don Carlos never had fallen in love with the queen, and that she was never too intimate with him. In 1563 Philip, who had no other heir than Don Carlos, considering him unfit for the throne, sent for his nephews, the archdukes Rodolph and Ernestus, to secure to them the succession to his dominions. Don Carlos, who lived in continual misunderstanding with his father, resolved in 1565 to leave Spain, and was on the point of embarking when Ruy Gomez de Silva, a confidant both of Philip and Carlos, dissuaded him from his resolution. In 1567, when the rebellion in the Low Countries disquieted Philip, Don Carlos wrote to several grandees of the kingdom that he had the intention of going to Germany. He disclosed his plan to his uncle, Don Juan of Austria, who mildly dissuaded him from it, and represented to him that most of the grandees to whom he had written would not omit to inform the king. This was in fact done; and indeed Don Juan himself told Philip what Don Carlos had confided to him. It is believed that he was touched by the sufferings of the people of the Netherlands. Philip himself seemed to believe that his son intended to go to the Netherlands. The Baron Montigny lost his head on this account. The infant had often shown a vehement desire to participate in the government. But Philip, jealous of his own authority, treated his son coolly and with reserve, whilst he gave his confidence to the Duke of Alva, to Ruy Gomez de Silva, Don Juan of Austria, and Spinola. Don Carlos conceived an invincible aversion to them. He could not bear that Alva should have received the government of Flanders, which he had requested for himself. The architect of the Escurial, Louis de Foix, gives the following facts relating to Don Carlos, which have been preserved to us by De Thou. The prince had always under his pillow two naked swords, two loaded pistols, and at the side of his bed several guns, and a chest full of other fire-arms. He was often heard to complain that his father had deprived him of his bride. On Christmas evening he confessed to a priest that he had resolved to murder a man. The priest, therefore, refused him absolution. The prior of the monastery of Atocha artfully drew from him expressions from which it could be inferred that he meditated an attempt upon his own father. The confession was then communicated to the king, who exclaimed, 'I am the man whom my son intends to murder; but I shall take measures to prevent it.' Thus Philip, impelled by hatred or fear, by policy or superstition, resolved on the destruction of his only son, in whom he saw only a criminal, unworthy of the crown. On the night of Jan. 18, 1568, while Don Carlos was buried in a deep sleep, Count Lerma entered his chamber and removed his arms. Then appeared the king, preceded by Ruy Gomez de Silva, the Duke of Feria, the grand prior of the order of St. John, brother of the Duke of Alva, and several officers of the guard, and state councillors. Don Carlos still slept. They awoke him: he beheld the king his father, and exclaimed, 'I am a dead man.' Then, addressing Philip, he said, 'Does your majesty wish to kill me? I am not mad, but reduced to despair by my sufferings.' He conjured with tears those who were present to put him to death. 'I am not come,' answered the king, 'to put you to death, but to punish you as a father, and to bring you back to your duty.' He then commanded him to rise, deprived him of his domestics, ordered a box of papers under his bed to be seized, and committed him to the care of the Duke of Feria and six noblemen, enjoining them not to permit him to write nor to speak with any one. These guards clothed Don Carlos in a mourning dress, took from his chamber the tapestry, the furniture, and even his bed, leaving him nothing but a mattress. Don Carlos, full of rage and despair, caused a large fire to be kindled, under pretext of the extreme cold of the winter, and threw himself suddenly into the flames. It was with difficulty that he was rescued. He attempted by turns to finish his life by thirst, by hunger, by eating to excess. After Philip had endeavoured to justify his measures to the pope and the principal sovereigns of Europe, and had also given notice to the superior clergy, to the courts of justice, and to the cities of his empire, of what had passed, he referred the case of the prince, not to the Inquisition, but to the council of state, under the direction of Cardinal Espinosa, who was state councillor, grand inquisitor, and president of the junta of Castile. This court is said, after a minute examination and hearing many witnesses, to have condemned him to death. Other accounts, however, state that he died of a malignant fever before any judgment was passed, after having taken the sacrament with much devotion, and having asked his father's pardon, 24th July, 1568. The melancholy fate of Don Carlos has served as a subject for several tragedies—those of Schiller, Alfieri, Otway, and Campistron.

CARLOS DE BOURBON, DON MARIA ISIDOR, the second son of Charles IV. of Spain and brother of Ferdinand VII., was born on 29th March, 1788. In 1808 he was compelled by Napoleon along with his brother, who had now succeeded to the throne, to renounce all claims to the succession, and was detained with Ferdinand in captivity at Valençay in France till 1814. In 1816 he married Maria Francisca d'Assis, daughter of John VI. of Portugal, his brother the King of Spain having at the same time espoused another daughter of John as his second wife. This last marriage, like Ferdinand's first, having turned out unproductive of issue, a prospect opened to Don Carlos of succeeding to the crown, which almost assumed the shape of absolute certainty when a third marriage contracted by Ferdinand proved equally unsuccessful with the two former in producing an heir to the Spanish monarchy. On the death of Ferdinand's third wife in 1829 he again married, and, by a pragmatic sanction, the contingency of a female heir was provided for by the repeal of the Salic law, which excluded such from the throne. On 10th October, 1830, Maria Isabella, afterwards Queen of Spain, was born. In 1832 Don Carlos' party succeeded by taking advantage of the king's imbecile condition to obtain a repeal of the pragmatic sanction; but this advantage was only temporary, as Ferdinand disowned his act on recovering the use of his reason. The following year Don Carlos was exiled with his wife to Portugal; and having refused to return from thence to be present at the taking of the oath of allegiance to the young queen, he was commanded by Ferdinand to retire to the Papal States. On 29th September, 1833, Ferdinand VII. died, and a few days afterwards his consort the queen-regent repeated the order to his brother to quit the country. The latter, however, now announced himself as legitimate King of Spain, and was recognized as such by a considerable party who excited a civil war in his favour, and thenceforward were designated by the title of *Carlists*. (See SPAIN.) After a course of hostilities extending over several years with varying success, he found himself obliged in 1839 to take shelter in France. In the meantime he and his descendants had been formally excluded from the succession by a vote of the Cortes in 1836. On arriving in France the castle of Bourges was assigned him as a residence, and he was also detained a prisoner there for a considerable time owing to his refusal to make the renunciations demanded of him. In 1845 he resigned his claims in favour of his eldest son, and in 1847 was permitted to take up his abode in Trieste, where he died on 10th March, 1855. His eldest son, Don Carlos, was long resident in London, and in 1850 married Maria Carolina Ferdinanda, a sister of Ferdinand II., king of Naples. On more than one occasion he endeavoured to excite an insurrection in his favour in his native country, but these attempts were always frustrated. In 1860, when he made his last venture, he and his army were taken prisoners by the troops of Isabella. The rebel general was shot, and Don Carlos liberated only on condition of solemnly renouncing all claims to the crown—an act which he repudiated when he got out of the hands of his enemies. He died at Trieste in 1861. The Carlist claims are at present represented by another Don Carlos, a nephew of the preceding, born in 1848. He was at the head of a formidable insurrection in Spain in 1873–76. See SPAIN.

CARLOW, an inland county of Ireland, in the province of Leinster, surrounded by Kildare, Wicklow, Wexford, Kilkenny, and Queen's County. It is generally level or undulating except in the south-eastern parts. The chief rivers are the Slaney and Barrow. From the remarkable fertility of its soil it is altogether an agricultural county, producing a great deal of butter, corn, flour, and other agricultural produce for exportation. Agriculture is here carried on with as much skill and knowledge of recent improvements as anywhere in Ireland, and there is less poverty than in most parts. Carlow comprises an area of 346 square miles or 221,334 acres, of which 195,831 are arable. The county returns one member to Parliament. Pop. in 1891, 41,964; in 1901, 37,723.

CARLOW, capital of above county, on the left bank of the Barrow, 34 miles S.W. of Dublin, with which it is connected by railway and canal. It has two principal streets intersecting at right angles. A bridge of five arches leads over the Barrow to the suburban village of Graigue, in Queen's County. The principal public buildings are the churches, the Roman Catholic college, three convents, barracks, a lunatic asylum, a court-house, town-hall, union workhouse, an infirmary, and a fever hospital. It is lighted by electricity, and has an excellent water-supply. There is a large new cemetery. Carlow is the principal mart for the agricultural produce of the surrounding country, and carries on an extensive trade in corn, malt, butter, &c. Till 1885 it sent a member to the House of Commons. On a rising ground to the south stand the ruins of the ancient castle of Carlow, still presenting a very imposing appearance. Pop. in 1881, 7185; in 1891, 6619.

CARLOWITZ, or KARLOWITZ, a town of Austrian Slavonia, on the Danube, 7 miles S.E. Peterwardein; pop. 5800. It is the see of a Greek archbishop, the head of the dissenting Greeks in the Austrian dominions. It is the centre of a famous wine-growing district. This town is remarkable for a peace concluded here in 1699 between Leopold I., Emperor of Germany, Poland, Russia, Venice, and the Turks. By this peace the emperor received Transylvania and Slavonia; Poland received back Kaminiec, Podolia, and the Ukraine; Venice retained the conquered Morea; Russia, Azoph. Here, too, Prince Eugene defeated the Turks in 1716.

CARLSBAD (Charles's Bath), in the Kingdom of Bohemia, one of the most famous watering-places in the world, is situated in a deep, narrow valley of the river Tepl. It is said that Charles IV. discovered the warm springs here in 1358, during a chase, and having experienced their healing effects, he built a castle, round which houses gradually accumulated. The town has a permanent pop. of about 12,000. Ample provision has been made for the amusement of the visitors of this place Fine buildings have been erected, and beautiful promenades laid out. A great many strangers are attracted here every year, the number in recent years reaching 16,000. A congress of the German powers was held here 1819–20 at which were passed resolutions restrictive of the liberty of the press and liberal principles in general.

CARLSBURG, or KARLSBURG (ancient *Apulum*), a town of Transylvania, on the right bank of the Maros, 33 miles N.W. of Hermannstadt, with 7338 inhabitants. It consists of an upper and a lower town, situated on opposite sides of the river, and communicating by a long bridge. It is defended by a citadel, and has a cathedral with a number of ancient monuments, a mint where the gold and silver obtained in Transylvania are purified and coined, an observatory with a good collection of instruments, an excellent library, a theological college, a gymnasium, normal school, arsenal, barracks, &c.

CARLSCRONA, or KARLSKRONA (Charles's Crown), a seaport at the southern extremity of Sweden, on the Baltic, capital of the län or province of Blekinge or Carlscrona. It stands on several rocky islets connected with one another and with the mainland by bridges, has broad, clean, but somewhat steep streets, with houses mostly built of wood. The harbour is safe and spacious, the entrance protected by forts. As the chief Swedish naval station the town largely depends on the trade thereby occasioned, but it has also a considerable export trade in timber, tar, potash, tallow, &c. Pop. (1890), 20,613.

CARLSHAMN (Charles's Haven), a seaport town, Sweden, 27 miles W. of Carlscrona, in a beautiful valley at the mouth of the Mie-A. It is prettily and regularly built, and its square market-place, planted on all sides with trees, has a fine appearance. It has an elegant townhouse, a good harbour, and an active trade. Timber and articles of timber constitute the chief exports. The manufactures are, sail-cloth, sacking, tobacco, leather, &c.; and there is also some ship-building. Pop. (1890), 7191.

CARLSRUHE (Charles's Rest), the capital of the grand-duchy of Baden, was laid out in 1715, and is one of the most regularly-built towns in Europe. The castle of the grand-duke stands in the centre of the city, and from this point a number of streets radiate at regular distances from each other, thus forming a kind of star. Other streets intersect these in parallel circles. The roads leading to the city correspond to this regular disposition, which, as is apt to be the case in strictly regular cities, often leaves upon the traveller the impression of monotony rather than that of agreeable order. The city is ornamented with several beautiful public buildings. The court library contains 150,000 volumes; there are also here several valuable museums and cabinets, a botanic garden, several institutions for the promotion of literature and the fine arts, and sundry industrial establishments, such as a foundry and electro-plating work, an engine factory, a carriage work, &c. Pop. (1890), 73,496.

CARLSTAD, a town, Sweden, capital of the län of same name, on an island in Lake Wener formed by the two mouths of the Klar, and connected with the mainland by a bridge across either stream. It is beautifully situated, regularly built, is the seat of a bishop, and has a cathedral, gymnasium, town-house, &c., and some trade. Pop. (1890), 8716.

CARLSTADT, a town of Austria, in Croatia, 34 miles s.w. of Agram, agreeably situated in a perfectly level and richly-cultivated plain near the junction of the Kulpa, Korana, and Dobra, which are here navigable. It consists of the town proper and the citadel, together with the suburb of Dubovacz. It is tolerably well built, and has an important trade. Pop. (1890), 5559.

CARLSTADT, Andreas Rudolf (so called from his native town, Carlstadt, in Franconia, where he was born in 1480), is celebrated in the history of the Reformation for his fanaticism as well as his misfortunes. He was appointed professor of theology at Wittenberg in 1513. His learning enabled him to render great support to Luther in his first steps for the introduction of a reformation. In 1520 he was included in the bull which condemned Luther; and his spirited appeal from the pope to a general council, of which he gave the first example, as well as his opinion, openly expressed, in favour of the marriage of the priesthood, which soon gained ground, was among the many proofs which he gave of his zeal for the Reformation. Whilst Luther was at Wartburg Carlstadt's zeal urged him to acts of violence. He even instigated the people and students to the destruction of the altars and the images of the saints, greatly to the displeasure of Luther, who lost the friendship of Carlstadt by his opposition to his excesses. In 1524 he declared himself publicly the opponent of Luther, who had preached at Jena against the disturbances which he had excited, so that the Elector Frederick banished him from the country in September, 1524. Carlstadt upon this commenced the controversy respecting the sacrament, denying, in opposition to Luther, the bodily presence of Christ in the sacramental elements, and recognizing in the rite a token of remembrance simply. This controversy was carried on with the bitterest animosity; and Zwinglius having declared himself in favour of Carlstadt's doctrine, a dispute commenced between the Swiss and Wittenberg theologians, which ended in the separation of the Calvinists and Lutherans. Carlstadt in the meantime, being suspected, not without reason, of having taken part in the revolt of the peasants in Franconia, was obliged to wander through Germany, and being ultimately reduced to extreme distress, sought relief of Luther, who procured him an asylum at Kemberg, on condition that he should refrain from the expression of his opinions. Here he lived nearly three years. His restless mind, however, soon led him to break his promise, by the publication of some writings in 1528; and he even went so far as to plot against Luther's person. To escape from the consequences of his conduct he repaired to Switzerland at the end of the same year, where he was appointed vicar of Altstadt, in the valley of the Rhine; in 1530, deacon at Zürich; and in 1534, vicar and professor of theology at Basel, where he died in 1541 or 1543.

CARLYLE, Alexander, D.D., a divine of the Scottish Church, was born on 26th January, 1722, in Dumfriesshire, where his father was a parish minister. He was educated at the universities of Edinburgh and Glasgow, and afterwards studied at the University of Leyden. Having been licensed as a preacher, in 1747 he was presented to the parish of Inveresk, in Mid Lothian. Here he continued to the end of his life, which terminated on 25th August, 1805. His wife and children all predeceased him. Dr. Carlyle was one of the leaders of the Moderate party in the Scottish church, the party which, during the latter half of the eighteenth century, ruled with such predominating sway, and included the names of Robertson, Blair, and Home among its members. As an eloquent debater and skilful ecclesiastical leader in the General Assembly he had no rival. He strenuously resisted all attempts to give additional influence to the popular element in ecclesiastical matters. Notwithstanding his literary abilities, he never came forward as a claimant before the public for any literary honours. He, however, left behind him a well-known autobiography, which, though commenced in his seventy-ninth year, is a singularly interesting production, both from the vigour and sprightliness of its style, and the pictures which it presents of Scottish society in the 18th century. After remaining long in manuscript it was published in 1860, under the editorship of John Hill Burton.

CARLYLE, Thomas, the greatest writer that Scotland has produced since the time of Sir Walter Scott, and one of the greatest English writers of the nineteenth century, was born 4th December, 1795, in the village of Ecclefechan, in the parish of Hoddam, Dumfriesshire. He was the eldest son of James Carlyle, a mason and afterwards a farmer. James Carlyle was a serious God-fearing man of great intellectual power, while his wife, Margaret Aitken, the future writer's mother, is represented to have been affectionate, pious, and intelligent. The elder Carlyle was a member of the dissenting body known as the Relief Church, and intended his son Thomas for a minister of this church, with which object he was carefully educated at the parish school and afterwards at the burgh school of Annan. When only in his fifteenth year (in 1810) he was sent to the University of Edinburgh, where he studied under such professors as Leslie, Playfair, and Dr. Thomas Brown. Here he developed a strong taste for mathematics, a study in which he attained great proficiency. Having renounced the idea of becoming a minister, after finishing his curriculum (in 1814) he became a teacher for about four years, first at Annan, afterwards at Kirkcaldy, where he conducted the burgh school, and left behind him the character of an over-stern disciplinarian. At the latter place the celebrated Edward Irving, whom he had first met during his school-boy days at Annan, was then also acting as a teacher, and the two became very intimate friends. In 1818 he removed to Edinburgh, where he supported himself by literary work, devoted much time to the study of German, and went through a varied and extensive course of reading in history, poetry, romance, and other fields. His first literary productions were short biographies and other articles for the Edinburgh Encyclopædia, an extensive work edited by Brewster. After three years of hard work and poverty in Edinburgh his health broke down, and he retired for a time to his father's farm in Dumfriesshire. He was next engaged to act as tutor to the sons of Mr. Buller, one of whom was afterwards honourably known in public life. This post he held for about two years.

During this period his career as an author may be said to have really begun, with the issue in monthly portions of his Life of Schiller in the London Magazine, in 1823, this work being enlarged and published separately in 1825. In 1824 he published a translation of Legendre's Geometry, with an essay on proportion by himself prefixed, which Prof. De Morgan characterized as 'thoughtful and ingenious, as good a substitute for the fifth book of Euclid as could have been given in the space.' The same year appeared his translation of Goethe's Wilhelm Meister's Apprenticeship. This work, which like the others mentioned was anonymous, was on the whole favourably received, though some critics objected to the translator's too great fondness for German idioms. During his tutorship he stayed some time in London (in 1824), where Irving then was. He was next engaged in translating specimens of the German romance writers, published in 4 vols. in 1827. In 1826 he married Miss Jane Bailie Welsh, daughter of a doctor at Haddington, and a lineal descendant of John Knox. After his marriage he resided for a time in Edinburgh, and then withdrew to a farm in Dumfriesshire belonging to his wife, about 15 miles from the town of Dumfries. This place, Craigenputtock, he describes in a letter to Goethe (written in 1828), as 'the loneliest nook in Britain, an oasis in a wilderness of heath and rock, among the granite hills and the black morasses which stretch westward through Galloway almost to the Irish Sea.' Here he wrote a number of critical and biographical articles for various periodicals, such as the Edinburgh Review, the Foreign Quarterly, and Fraser's Magazine; and here was written Sartor Resartus, the most original of his works, the one which first brought him fame, and which has had perhaps a greater influence on the minds of readers than any single work that could be named. The writing of Sartor Resartus occupied portions of several years. It seems to have been finished in 1831, but the publishers were shy of it, and it was not given to the public till 1833–34, through the medium of Fraser's Magazine. The whimsical title of this work (literally, The Tailor Repatched) is a translation of that of an old Scottish song (The Tailor Done over). The book professes to be an exposition for English readers of a new philosophy, the philosophy of clothes, first thought out and expounded by Diogenes Teufelsdröckh (Devil's Dirt, Asafœtida), professor of things in general in the German university town of Weissnichtwo (Know-not-where, Scotch Kennaquhair); with biographical particulars regarding the professor, and miscellaneous thoughts, reflections, and speculations of his not strictly connected with his philosophy. The professor of course is really Carlyle himself, and the work is to some extent autobiographical. It is inspired by a distinctly didactic purpose, preaching through its wonderful intermixture of the humorous, the grotesque, the sublime, the pathetic, the solemn, the profound, welded together by a poetic or even a prophetic spirit, the doctrines of truthfulness, obedience, duty, work, and above all hatred of sham.

The publication of Sartor (to which no author's name was originally attached) soon made Carlyle famous, and on his removal to London early in 1834 he became a prominent member of a brilliant literary circle embracing John Stuart Mill, Leigh Hunt, John Sterling, Julius Charles and Augustus William Hare, Maurice, and his old pupil Charles Buller. He fixed his abode at Cheyne Row, Chelsea, where his life henceforth was mainly spent. His next work of importance was on the French Revolution, published in 1837. This, though a work of immense research, is hardly a history in the ordinary sense of the term; it is rather a series of powerful pictures, in which we see taking place the chief events and are made intimately acquainted with the chief actors of that stormy period. Of it the Westminster Review remarked, 'No work of greater genius, either historical or poetical, has been produced in this country for many years.' The first volume of the French Revolution, while still only in MS., was unfortunately burned while in John S. Mill's possession, and the author had immediately to set to work and write it over again. About this time, and on one or two subsequent years, he delivered several series of lectures, the most important of these, On Heroes and Hero-worship, being published in 1840. Chartism, published in 1839, and Past and Present, in 1843, were small works bearing more or less on the affairs of the time. In 1845 appeared his Oliver Cromwell's Letters and Speeches, with Elucidations, a work of great research, and brilliantly successful in vindicating the character of the great Protector. In 1850 came out his Latter-day Pamphlets, a series of tracts dealing with political subjects, and assailing with extraordinary vehemence, not to say virulence, the most prominent institutions and characteristics of modern England and its people. This work was very repulsive to many from the exaggeration of its language, and its advocacy of harsh and coercive measures. He next wrote a life of his friend John Sterling, published in 1851, and regarded as a finished and artistic performance.

The largest and most laborious work of his life, The History of Friedrich II. of Prussia, called Frederick the Great, next appeared, the first two volumes in 1858, the second two in 1862, and the last two in 1865, and after this time little came from his pen. His choice of Frederick as a hero strikes most people as a little remarkable, a feeling that the author was himself prepared for. He gives as his reasons for selecting him for historical treatment that he was the man that did almost the only real and substantial work in his century; that there was nothing of the hypocrite or sham about him; and that 'How this man, officially a king withal, comported himself in the eighteenth century, and managed *not* to be a liar and charlatan as his century was, deserves to be seen a little by men and kings, and may silently have didactic meanings in it.' He is reported to have said in conversation that he had tried to put a little humanity into Frederick, but found it hard work. Of the immense labour and research shown in this work, of the descriptive and narrative power displayed on almost every page, of the vividness with which a portrait is drawn, or an event put before us, it is almost impossible to speak too highly. At the same time it can hardly be denied that too often the author's powers as a skilled advocate have been enlisted in favour of 'Vater Fritz' and his doings. Frederick the Great was soon translated into German, and has naturally been popular in Germany.

In 1866, having been elected Lord Rector of Edinburgh University, he delivered an installation address to the students On the Choice of Books. While still in Scotland the sad news reached him that his wife had died suddenly in London. This was a severe blow to Carlyle. Mrs. Carlyle, besides being a woman of exceptional intellect, was a most devoted and affectionate wife. On her tombstone beside the abbey church of Haddington he has recorded her virtues and his sorrow for her loss, stating that at her death his light was as if gone out. From this time his productions were mostly articles or letters on topics of the day, including Shooting Niagara; and After? in which he gave vent to his serious misgivings as to the results of the Reform Bill of 1867 An unimportant historical sketch, The Early Kings of Norway, appeared in 1874, but was written long before. Carlyle died at Chelsea, February 5th, 1881, and was buried at Ecclefechan. He left the estate of Craigenputtock to the University of Edinburgh, settling that the income from it should form ten bursaries to be annually competed for—five for proficiency in mathematics and five for classics (including English). In 1881 Carlyle's Reminiscences connected with the earlier part of his life were published by J. A. Froude, who also published a biography of Carlyle (1882–84, 4 vols.), and edited the Letters and Memorials of Mrs. Carlyle (1883). In the last-named year was published the Correspondence of Carlyle and Emerson between 1834 and 1872.

Carlyle's command over the English language was greater than that of almost any other prose writer, and his style was unique. It has been called unnatural, a distortion of the English language, a mere literary device or affectation to attract notice; but this is but a superficial criticism. That it is often eccentric, often uncouth, often rugged, often extravagant, may be admitted; but one who studies it cannot but recognize that it was so only as being the natural vehicle of expressing his thoughts. It grew and developed as the writer grew and developed, and in his hands was an instrument of unsurpassable power. As to the influence exercised by his writings we may quote the following estimate from a distinguished and discriminating American critic (J. R. Lowell): 'Though not the safest of guides in politics or practical philosophy, his value as an inspirer and awakener cannot be overestimated. It is a power which belongs only to the highest order of minds, for it is none but a divine fire that can so kindle and irradiate. The debt due him from those who listened to the teachings of his prime for revealing to them what sublime reserves of power even the humblest may find in manliness, sincerity, and self-reliance, can be paid with nothing short of reverential gratitude.'

CARMAGNOLE, a name applied in the early times of the French Republic (1792–93) to a song and a dance, by which it was accompanied. The song contained thirteen couplets and the following refrain :—

Dansons la carmagnole
Vive le son, vive le son
Dansons la carmagnole,
Vive le son du canon.

The appellation originated, probably, from the name given to a peculiar form of vest worn by the Confederates of Marseilles, who came to Paris, Aug. 1792, to co-operate with the revolutionaries of the capital. The author and composer of the song are unknown. It is notable simply for its historical associations; not for the intrinsic merits of words or music. The song and dance were first used at the time of the indignation of the people on account of the *veto* allowed to the king on the resolves of the National Assembly. The carmagnole was commonly sung and danced at popular festivals, executions, and eruptions of popular discontent. Afterwards the name was also applied to the national guards, who wore a dress of a peculiar cut, and to the enthusiastic supporters of the revolution. Several members of the National Convention—Barère, for instance—by way of jest, gave this name to their communications to the assembly.—*Petits carmagnoles* was a name given by the people in Paris to boys who swept chimneys and blacked boots, chiefly Savoyards.

CARMARTHEN, or CAERMARTHEN, a maritime county, South Wales, and the largest of all the Welsh counties, having Cardigan on the N., the Bristol Channel and part of Glamorgan on the S., Pembroke on the W., and Brecknock on the E.; extreme length, 53 miles; breadth, 35 miles; area, 594,405 acres. It is of a mountainous character generally, but not so rugged as some of the other Welsh counties, neither are the mountains so high. Some of the vales are beautiful and extensive, particularly that of Towy, which is 30 miles in length. The principal river is the Tywi or Towy, which rises in Cardiganshire. This river and the Tave are the only navigable streams in the county. A large part of the county is waste; but the valleys are fertile, and numerous herds of small black cattle are reared on the hills. About three-fourths of the total acreage is under crops, bare fallow, and grass. The mineral products of the county are iron, lead, coal, and limestone. There are no manufactures of any consequence. The county returns two members to the House of Commons. Pop. in 1891, 130,566; in 1901, 135,325.

CARMARTHEN, or CAERMARTHEN (Welsh, *Caer Fyrddyn*), a town, South Wales, capital of above county, 9 miles from Carmarthen Bay, Bristol Channel, and 14 miles N.W. of Llanelly, on a moderate eminence on the right bank of the Towy, over which there is a spacious bridge of seven arches. It has tolerably straight streets, and the houses are mostly well built, some of stone and some of brick. The principal buildings are—the county hall, St. Peter's church, an ancient edifice containing numerous antique and curious monuments; St. David's church, a plain substantial structure. There are also a monument to Sir Thomas Picton, and a well-executed statue of General Nott, a native of the place. Besides the established churches there are numerous places of worship belonging to other denominations. Of public and private schools the most prominent are the South Wales Training College, Sir Thomas Powell's Free Grammar-school, Queen Elizabeth's Grammar-school, &c. There are also two infirmaries, and a literary and scientific institution. The shipping trade has greatly decreased since the opening of the South Wales Railway. There are some tin and lead works, cloth manufactories, and iron-foundries, and the salmon fishery is extensive. With Llanelly it returns a member to the House of Commons. Pop. in 1881, 10,514; in 1901, 9935.

CARMEL, a mountain in Palestine, constituting part of Lebanon, on the southern frontier of Galilee, in the pashalic of Acca. It consists of several rich, woody heights, separated by fertile and habitable valleys within a circuit of about 28 miles, and terminates at the mouth of the Kishon in a lovely plain, which forms the southern coast of the Gulf of Ptolemais or Acca, on the Mediterranean. Upon different parts of this mountain there are ruins of churches and monasteries from the time of the Christian kingdom of Jerusalem, and the cave which, according to tradition, was inhabited by the prophet Elijah.

CARMELITES, or ORDER OF OUR LADY OF MOUNT CARMEL, a religious order founded on Mount Carmel in 1156. In 1209 Albert, patriarch of Jerusalem, fixed the rule of the order, which, among other things, forbade the holding of property and the eating of meat, and imposed a strict fast (except on Sundays) from the Exaltation of the Cross to Easter. The advance of Mohammedanism forced the Carmelites to leave Palestine, and they therefore settled about 1238 in Cyprus and elsewhere. In 1245 they held their first chapter at Aylesford in Hampshire, and appointed as their general St. Simon Stock, an Englishman. Under his government the order rapidly extended throughout Europe, becoming at the same time less severe in its discipline; and in 1247 Innocent IV. confirmed them as an order of mendicant friars. In 1431 Eugenius IV. still further relaxed the rule of the order, especially in regard to meat-eating; but since many convents refused to accept this change a distinction came to be recognized between Observantines, adhering to the rule of Innocent IV., and Conventuals, who accepted Eugenius's changes. John Soreth, a general of the order, founded an associated order of Carmelite nuns in 1452; of these perhaps the most famous is the Spanish St. Teresa, who in the sixteenth century introduced more rigorous observances into many Carmelite convents, both of men and of women. Those who accepted her changes were known as Discalced Carmelites, from their habit of going barefooted. In 1593 Clement VIII. separated them from the other Carmelites and placed them under a general of their own. At present there is a house of Discalced friars in Kensington, besides nunneries at various places. In Ireland, too, there are several Carmelite convents.

CARMINATIVES, medicines obtained chiefly from the vegetable kingdom, and used as remedies for flatulence. They are said to derive their name from the Latin word *carmen*, from their often operating almost instantaneously, like a *charm*. The gases generated in the intestinal canal are chiefly the result of indigestion, and hence the persons most affected by them are infants, whose stomachs are generally feeble, and individuals who lead a sedentary life. Plants possessed of an aromatic principle, in consequence of the volatile oil which they contain, give relief not only when taken internally, but sometimes even when applied externally to the surface of the stomach. Sometimes the oil itself, or the tincture of the plants dropped upon sugar, is administered. These, however, are only temporary remedies, and the true cure is in the adoption of a regimen by which the digestive process is improved, and more especially by regular and daily exercise in the open air.

CARMINE, the most splendid of all the red colours, is made from the cochineal insect, or *Coccus cacti.* The finest is that which is thrown down from an aqueous infusion by chloride of tin. This after depositing is collected and dried. The operations require the greatest care, for the brilliancy of the colour is affected by the weather, light, and temperature. The colour produced by alum has a darker tint, and constitutes lake. *Carmine*, or carminic acid, is also the name given by chemists to the colouring matter of cochineal. The acid is a purplish body, extremely soluble in water and in alcohol. It forms salts with the heavy metals, and it yields various products when acted on by chlorine, nitric acid, and other re-agents. See Coccus.

CARMONA (ancient *Carmo*), a town, Spain, Andalusia, 20 miles E.N.E. of Seville, on a height overlooking a large plain covered with olive-trees. Pop. 17,421. It is walled and well built, containing many handsome mansions belonging to the nobility, who, though usually resident in Seville, spend part of the year here. The principal square is well planted, and, among other edifices, possesses a handsome Gothic church with a lofty spire. Another conspicuous object is a Moorish castle, flanked with massy towers, and there are two old Roman gates. The manufactures are chiefly woollen hats, leather, and earthenware.

CARMONTEL, or Carmontelle, a French poet, known by his Proverbes Dramatiques (ten vols.); born in 1717 at Paris; died 1806. These little pieces are without much connection in themselves, being, in fact, only a series of dramatic scenes, but are well adapted for private theatres. The fertility of Carmontel was as extraordinary as his ease in writing. He is said to have left, besides his printed works and his pieces for the theatre, more than a hundred volumes of manuscripts.

CARNAC, a village, France, in the department of Morbihan, on a height near the coast, 15 miles S.E. of Lorient, and remarkable for the Druidical monuments in its vicinity. These consist of about 1000 rude blocks of gray granite, some of which are upwards of 18 feet high, standing on end in the midst of a wide heath. They are in the form of unpolished obelisks, with the vertex reversed, and are arranged in eleven lines, forming ten avenues, with a curved row at one end. There are many gaps in the lines; almost every house and wall in the vicinity is seemingly built from this artificial quarry. They are evidently of very ancient date, but their origin is unknown.

CARNALLITE. A double chloride of magnesium and potassium ($2MgCl_2 2KCl 12H_2O$), forms the chief part of, and has given its name to, the uppermost division of the great salt deposit of Stassfurt. The carnallite region, which contains a number of minerals besides carnallite, was previously called *Abraumsalz*—that is, 'refuse salt,' or the salt which was put aside in mining for the rock-salt, that forms the lowest stratum of the deposit. But the large amount of potassic salts which the carnallite region contains has gradually made the abraum-salt the most valuable part of the whole mines, and the operations on the large scale for the extraction of the potassic salts have grown to such an extent, that in a comparatively short time they have converted Stassfurt from a little village into the centre of a great industry. Carnallite occurs both of a white and red colour, associated with rock-salt, stassfurtite, and other minerals, and inclosing scales of micaceous ferric oxide. It is crystalline and deliquescent. The potassic chloride is extracted from it by a complicated series of solutions, during which chloride and sulphate of magnesium, and rock-salt, are got rid of. The chloride is used as a fertilizing agent, but it is also manufactured into nitrate, by decomposition with nitrate of sodium; and into carbonate, by Leblanc's process, the same as that by which common salt is converted into washing soda. The utilization of the carnallite has had a very marked effect in lowering the price of potassium salts, and especially of nitre, and in increasing the value of nitrate of sodium. See Stassfurt.

CARNARVON, or Caernarvon, a maritime county of North Wales, having Carnarvon Bay on the W.; Denbigh on the E.; the island of Anglesea and the Irish Sea on the N.; and Cardigan Bay on the S. Its extreme length, S.W. to N.E., is about 52 miles; extreme breadth, 20 miles, although the greater portion of it does not exceed 7 or 8 miles on an average; area, 369,477 acres. This county is traversed throughout its whole length by lofty mountains, including the Snowdon range, whose highest peak is 3557 feet above the sea. There are other summits varying from 1500 feet to more than 3000 feet. Although, however, the most mountainous county in Wales, there are many tracts of low and fertile land, some of it affording rich pasturage, and other parts bearing large crops of barley and oats. Dairy farming, and cattle, horse, and sheep breeding are, however, the principal occupations of the farmer. The cattle and sheep are of a small breed. Lead and copper ores have been found in the mountainous districts, and some attempts have been made to work them, but with little success. It has been otherwise with the slate quarries at Bethesda, Llanberis, and Nantlle, which have been extensively and profitably worked. Large quantities of this slate, which is of the finest quality, are exported. Agriculture, though not so far behind as in some of the other counties of Wales, is still in an extremely backward state. Farm buildings and cottages are often in bad condition, though both buildings and implements have been much improved in modern times. It sends two members to the House of Commons. Pop. in 1881, 119,349; in 1891, 118,204; in 1901, 126,835.

CARNARVON, or CAERNARVON, a seaport town and parliamentary borough, North Wales, on the S.E. side of the Menai Strait, and capital of the above county, 209 miles N.W. London. The ancient walls thrown around it by Edward I., and flanked by round towers, are still pretty entire. Within there are ten narrow but regular streets; outside many new and handsome houses have been built of late years, and some spacious streets formed. The town is well lighted with gas, and is abundantly supplied with water. The magnificent castle or palace of Edward I., and in which Edward II. was born, stands at the W. end of the town, almost overhanging the sea, and is still externally entire. Great alterations have been made in its interior, with a view of partially restoring it to its original condition. Including its courtyards, &c., it covers about 2 acres of ground. The town is much frequented in the season by visitors. A beautiful promenade stretches along the Menai, and is much frequented. There are extensive ironworks in the town, which supply machinery for steamers, &c. The shipping trade is considerable, the port (estuary of the Seiont) admitting vessels of 400 tons. The exports are slate, coal, and copper ore; the imports timber, colonial produce, Manchester and Birmingham goods, &c. Pop. in 1901, 9760.

CARNATIC, a country in Hindustan, lying along the coast of Coromandel, from Cape Comorin, in lat. 8° to 16° N.; lon. 77° to 81° E.; 560 miles in length, and from 40 to 110 in breadth. The Carnatic was conquered by the British in 1783, but not finally ceded to us till 1801. The soil is generally sandy, and the climate is one of the hottest in India. A great portion of the land is rented by the Brahmans; all kinds of grain and rice are cultivated, and sugar, indigo, and cotton to some extent. The majority of the inhabitants are Hindus, the Mohammedans being but thinly scattered over the country. The principal towns are Madras, Pondicherry, Cuddalore, Tanjore, Trichinopoly, Madura, and Tinnevelly. The principal rivers are the Pennar, the Palaur, and the Cauvery.

CARNATION (from the Latin *caro, carnis*, flesh) signifies, in the fine arts, the colouring of the skin of the human body. The use of carnation requires very attentive study and great skill in the artist. It varies with the sex of the individual, with the classes and countries to which the subjects belong, with the passions, the state of the health, &c. The cheeks are, in a healthy subject, of a lively red; the breast, neck, and upper part of the arms of a soft white; the belly yellowish. At the extremities the colour becomes colder, and at the joints assumes a violet tint, on account of the transparency of the skin. All these shades require to be softly blended. Two faults in carnation are chiefly to be avoided—hardness, the fault of the masters of the fifteenth century, and too great weakness. Guido Reni not unfrequently painted his flesh so that it appeared almost bloodless. The French school has gone furthest in this respect. The flesh of the followers of this school often looks like porcelain or wax. Titian and Rubens are unrivalled in carnation.

CARNATION, a variety of the *Dianthus caryophyllus* or pink, much cultivated for its beautiful and sweet-scented double flowers. Those in most esteem with florists have a stem about 3 feet high, and flowers regularly formed, and marked with clear, well-defined stripes, widening out towards the ends of the petals. According to their colours they are classed under the three heads of flakes, which have only one colour, disposed in stripes on a white ground; bozards, with stripes of two colours; and picotees, in which the edges of the petals are notched, and spots instead of stripes are diffused, usually on a pale yellow ground.

CARNEADES, an eminent Greek philosopher, founder of the third or new academy, was a native of Cyrene, in Africa, and is supposed to have been born in the third year of the 141st Olympiad (218 B.C.) He studied first under Diogenes the Stoic, but subsequently attended the lectures of Egesinus, who explained the doctrines of Arcesilaus; and succeeding his master in the chair of the academy, he restored its reputation by softening the prevailing pyrrhonism and admitting practical probabilities. The doctrine of Carneades specifically was, that 'as the senses, the understanding, and the imagination frequently deceive us, they cannot be the infallible judges of truth, but that from the impression made by the senses we infer appearances of truth, which, with respect to the conduct of life, are a sufficient guide.' He was a strenuous opposer of Chrysippus, and attacked with great vigour the system of theology of the Stoics. He was an advocate of *free-will* against the *fate* of the same sect, and urged just the same difficulties in reconciling divine prescience with the freedom of human actions as have divided some contending sects of Christianity. One of the most distinguished events of his life was his being joined in an embassy to Rome with Diogenes the Stoic and Critolaus the Peripatetic, in order to gain the mitigation of a fine levied by the Roman senate on the Athenians. This extraordinary embassy was successful, and Carneades so captivated the people by his eloquence, one day delivering a harangue in praise of justice, and on the next proving it to be an odious institution, that Cato the censor, fearful of its effect on the Roman youth, persuaded the senate to send the philosophers back to their schools without delay. In his latter years Carneades became totally blind; he died in the ninetieth year of his age, continually complaining of the shortness of life, and lamenting that the same nature which composed the human frame could dissolve it.

CARNELIAN. See QUARTZ.

CARNIOLA (German, *Krain*), a duchy or province of Austria, between lat. 45° 10′ and 46° 20′ N.; and lon. 13° 50′ and 16° 25′ E.; having Carinthia and Styria N. and E., Croatia and Lombardy S. and W.; area, 3856 English square miles. It is covered with lofty mountains, some of which are about 10,000 feet high, and, generally speaking, is one of the most unfertile regions of the empire. Some districts, however, produce considerable quantities of wheat, barley, wine, and, in the S., fruits of various kinds, and excellent flax. Bees are numerous in South Carniola, and silkworms are reared. It has many small lakes, but few rivers of any importance. The largest is the Kulpa. There are some iron, lead, and quicksilver mines, the latter exceedingly rich. It abounds in clays and valuable stones, and in coal and marble. There are considerable manufactures of iron, fine linen, lace, woollen cloth, flannel, worsted stockings, leather, wooden articles, &c. Its chief exports are steelwares, quicksilver, hats, linens, glasswares, wax, wine, flour, &c.; principal imports—salt, oil, fruit, coffee, sugar, tobacco, cloths, cattle, &c. Carniola was made a duchy in the twelfth century, under the dominion of the Counts of Tyrol, who became extinct in 1335, and were succeeded by the Earls of Goerz. After the treaty of Vienna, in 1809, it was ceded to France, and incorporated in the Kingdom of Illyria. In 1814 it came again into the possession of Austria. Capital, Laibach. The inhabitants are industrious and temperate. Pop. in 1890, 498,390.

CARNIVAL. The same views which led men to propitiate the higher invisible powers by gifts, sacri-

ices, and purifications, also introduced fasts, abstinence from pleasure, and penances. By *fast* is meant an abstinence from the usual means of nourishment, in order to mortify the appetites, and thereby to propitiate the Deity. In every nation of importance customs of this kind are found. Their historical origin is in the religious customs of the East, where the priests were originally the physicians of the people, and prescribed these fasts as a part of the regimen necessary in this warm region, as well as from religious views. Fasts are observed to this day in the East. The religions of the Persians and the Hindus, those of the Mohammedans, and of the worshippers of the Lama, insist much on fasts. Few traces of them are found in the religion of the ancient people of the North. The earliest Christians fasted on the vigils (which see). The fasts on the *jejunia quatuor tempestatum*, which continued for three days every quarter of the year, were penances, as was that of the period of forty days (before Easter, or rather before Good Friday, *Quadrigesimæ*), which was called, by way of excellence, *the fast*, and which commemorated the forty days' fast of Jesus in the wilderness. With regard to the origin of Christian fasts, opinions differ. The most common is, that Telesphorus, bishop of Rome, in the middle of the second century, first instituted the forty days' fast as a rule of the church. By Pope Gregory the Great, about A.D. 600, Ash Wednesday was made the beginning of the fast, and the day before was called *fast eve*, because in the night of this day, at twelve o'clock, the fast began. This fast was preceded by a feast of three days, very obnoxious to the strict zealots. 'Christians,' it is said, 'on these days deliver themselves up to voluntary madness, put on masks, exchange sexes, clothe themselves like spectres, give themselves up to Bacchus and Venus, and consider all pleasure allowable.' This is the origin of the present carnival, or *Fasching*, as it is called in the S. of Germany, and which continues in that country from Twelfth Day to Ash Wednesday. The name *carnival* is derived from the Latin *caro, carnis*, flesh, and *vale*, farewell (according to Ducange, from the Latin denomination of the feast in the middle ages, *carnis levamen*, solace of the flesh), because at that time people took leave of flesh. Previously to the commencement of their long abstinence, men devoted themselves to enjoyment, particularly during the three last days of the carnival. The carnival is nothing but the *Saturnalia* of the Christian Romans, who could not forget their pagan festivals. At least it greatly resembles the Saturnalia which were celebrated annually in December, with all kinds of mirth, pleasure, and freedom, in honour of Saturn, and the golden age when he governed the world, and to preserve the remembrance of the liberty and equality of man in the youth of the world. In Rome, the carnival brought to view, in a lively manner, the old Saturnalia in a new form. During the last days of the carnival, and particularly during the day which preceded the long fast, mummeries, plays, tricks, and freedom of every kind, abounded. From Italy, the modern Saturnalia passed to the other Christian countries of Europe. The wealthiest class commenced their amusements eight or ten days before Ash Wednesday, the middle classes two or three days, the poor only observed one day (the *Fastnacht* of the Germans). In the amusements of this period the dramatic poetry of Germany had its origin, after the cities had attained a flourishing condition. Its first traces appeared in the thirteenth century. The mummeries of the carnival produced the idea of adopting some character, and carrying it through. To please the multitude, and make the laugh more certain, the manners of common life were caricatured. These exhibitions afterwards became more cultivated and developed. On fast eve persons in disguise sometimes went from one house to another, to make sport with their friends and acquaintances. A merry society of this kind formed a plan to represent some scene in their disguises, and hold a regular conversation at one of these mummeries. The unknown players received praises, entertainments, or presents. Encouraged by this success, the company grew stronger, their fables and speeches became longer by degrees, until they attained to regular representations of human life. It was in Nürnberg, renowned for its wares and its wit, that the first fast eve's play was produced, coarse and frolicsome, to suit the taste of the citizens. The earliest of these pieces that have come down to us date from 1450–70; they have a near relationship to the masques of the English and the farces of the French, as have the spiritual fast eve's plays, religious burlesques, to the Mysteries and Moralities. In Italy the carnival is now celebrated with the greatest show and spirit at Rome. It lasts for the ten days preceding Ash Wednesday, certain observances taking place on certain days. Some days, for instance, are devoted to the throwing of comfits, or of small plaster pellets that take their place, these being flung from the balconies of the houses upon the persons in the streets—especially in the Corso—who retaliate in the same way, and in order that they may do this many of them are mounted upon lofty cars or other vehicles, all being masked. On other days the finest equipages move along in procession, and flowers instead of comfits are thrown. Races of riderless horses in the Corso are another prominent feature of carnival time. After sunset on Shrove Tuesday everybody carries a lighted taper (these being known as *moccoletti*), and each tries to extinguish as many others as he can while keeping his own alight. Venice, Turin, Milan, Naples, Florence, &c., also celebrate the carnival with more or less ceremony, and the same can be said of various towns of the south of France, Nice in particular. The carnival at Rome has been excellently described by Goethe. In Germany the carnival is celebrated with any brilliancy only in the Catholic cities of the Rhine valley, Mayence, Bonn, but above all Cologne. In Protestant countries, generally, the feast is not observed to any extent.

CARNIVORA (see accompanying plates). All animals which prey upon other animals are carnivorous; but the term *Carnivora*, as the designation of a group, is now restricted to that order of mammals to which the cat, dog, bear, and seal belong. The head is small in proportion to the bulk of the body, and the skin is well covered with hair. The limbs, four in number, are fully developed, and are adapted either for walking or swimming. Two sets of teeth, deciduous or milk and permanent, are always developed in succession, and in both sets incisors, canines, and molars, are distinguishable. The order is divided into two groups, the *Fissipedia*, which include the animals popularly known as carnivores, namely, lion, wolf, bear, &c., whose life is terrestrial, and the *Pinnipedia*, or those which are specially adapted for aquatic life. These two divisions are sometimes treated as separate orders, but they form together a natural group united by the character of their deciduate placenta, which is a girdle or zone surrounding equatorially the sac containing the fœtus. This character separates them from the Cetacea, since in that order the placenta is diffuse and non-deciduate, a difference more important than the anatomical resemblances which exist between the seals and the whales. The bats were formerly included under Carnivora, but in them the placenta is discoid, and the dentition and anterior extremities present constant differences.

1. *Fissipedia.*—All the carnivores of this division, except the sea-otter (*Enhydra*), have six incisor teeth in each jaw, the canine teeth are prominent, and one of the molar series in each jaw is usually compressed laterally, so as to present a cutting edge. The toes are furnished with claws, and the anterior limbs are used for seizing and holding prey as well as for walking, but the thumb cannot be carried across the palm of the hand, so as to oppose the other digits. The skull is contracted behind the orbits, so as to give an hour-glass form when seen from above, and the posterior or cranial portion may be short and rounded as in the cat, or elongated as in the otter. The facial portion, of equal dimensions with the cranial in the cat, is in the wolf very much larger. The hollow formed by this constriction on either side of the head is bridged over by the wide zygomatic arch, and thus gives abundant room for the powerful muscles of mastication. The lower jaw is articulated to the skull, so that it can only be moved up and down. The incisor and canine teeth are represented by the formula $i\,\frac{3-3}{3-3}$, $c\,\frac{1-1}{1-1}$. The teeth behind the canines increase in size from before backwards, and vary from $\frac{4-4}{3-3}$ in the cat, to $\frac{8-8}{8-8}$ in the South African otocyon, the total number of teeth of all kinds ranging from 30 to 48. The posterior teeth are divided into premolars and molars, the last of the premolar series in the upper, and the first of the molar series in the lower jaw presenting the lateral compression and trenchant margin which earns for them the name of *sectorial* or *carnassial* teeth. Behind the carnassial the molars have tuberculated crowns which fit them, among other uses, to retain the food while it is cut by those in front: the number of these teeth is less the more purely animal is the diet. The stomach is simple and undivided, and, as a general rule, is more rounded in the flesh-eating genera. The limbs terminate in digits, which are never fewer than four, and are furnished with sharp claws, which, in the Felidæ, are retractile within sheaths of the integument on the dorsal surface of the toes. In walking, the extremities of the toes are applied to the ground, as in the digitigrade cat and dog; or the whole sole of the foot is put down, as in the plantigrade bear. Some of our illustrations show this clearly. The dhole, one of the digitigrade Canidæ, or dogs, is represented with as much of the hind foot applied to the ground in sitting as the bear applies when in the erect attitude. The six families included under the fissipede carnivores are—1. Felidæ: lion, tiger, leopard, cat, &c. These are all digitigrade, and possess retractile claws. In external form and dentition they present the highest type of the carnivorous structure. 2. Canidæ: wolf, dog, jackal, fox, &c. The claws are not retractile, and the gape is longer. The toes in this and the previous family are five on the anterior and four on the posterior extremities. 3. Hyænidæ: hyæna, aard-wolf, &c. The hyænas have the anterior limbs longer than the posterior, and both terminate in four toes. The skull and dentition approximate to those of the Felidæ. 4. Viverridæ: the supple elongated bodies of these animals are intermediate between those of the cats and the martens. Some, as the civet, gennet, zibet, have the claws retractile; in others, as the ichneumon and rasse, they are not retractile. Those mentioned are digitigrade, but the suricate of Central Africa is plantigrade. In this family glands are found under the tail, the secretions of which have powerful odours, and are used as perfumes. The civet is collected from time to time from animals kept for the purpose in Africa. The diet of this family is not purely animal. 5. Mustelidæ: the members of this family have elongated bodies with short limbs, terminating usually in five-toed feet, with retractile or non-retractile claws. The marten, weasel, polecat, ermine, glutton or wolverene, the most rapacious and cunning member of the group, constitute one sub-family of exclusively terrestrial life. They are digitigrade, and have retractile claws, as have also the members of another sub-family, the Lutrinæ, or otters, in which the toes are webbed and the tail is broad, provisions for its largely aquatic life to which the thick close fur is also an adaptation. The clumsy honey-eating ratel (*Mellivora*) of South Africa belongs to the plantigrade division, with non-retractile claws, characters shared also by the badgers (*Meles*), the skunk (*Mephitis*) of North America, and the teledu (*Mydaus*) of Java. 6. Ursidæ: in this family the carnassial tooth is no longer trenchant, but tuberculated. All are plantigrade, but the habits and aspect vary considerably: thus, the binturong (*Arctictis*) of Java, the kinkajou (*Cercoleptes*) of northern South America, and the panda (*Ailurus*) of East India, resemble in figure the Mustelidæ, but possess a prehensile tail. The racoon (*Procyon*) and coatimondi, both American genera, differ from the foregoing in having the toes straight, not bent, and the claws are non-retractile. The bears (Ursinæ) connect the terrestrial carnivores with the seals. These, the bulkiest of the order, have a very wide geographical range, the polar bear living, as its trivial name indicates, in the extreme N., while the brown bear ranges through the northern parts of the European, Asiatic, and American continents; and the Syrian, Thibetan, sloth, and Malayan bears, form a series of distinct species passing through all the climates of the northern hemisphere. The bears are omnivorous, and, at least the females, have a winter sleep. The racoon and its allies are sometimes made a family with the name Procyonidæ.

2. *Pinnipedia.*—The aquatic carnivores comprise three families, represented by the walrus or sea-horse (*Trichechus*), the eared seals (*Otaria*), and the common seals (*Phoca*). They are related to the preceding families through the otters and the bears, and agree in having the extremities modified into swimming-organs or flippers, and the teeth more nearly uniform in character. The walrus, which approaches nearest in form to the bears, has the tail connected for half its length to the hind limbs by a fold of skin, and the hind legs are directed backwards. In the eared seals the hind legs and tail are more closely connected, and in the seal the hind legs and tail form one uninterrupted swimming fin, so that in them the hind limbs can no longer support the body. The teeth of the walrus are similar in shape, except the canines of the upper jaw, which are prolonged into tusks, descending below the lower jaw. None of the teeth have ever more than two fangs, thus indicating an approach to the dentition of the porpoise. The Otaria is distinguished from the common seal by the existence of short conspicuous ears, and by the character of the fur, which constitutes the finer and more expensive sealskin of commerce. The figures on the third plate illustrate the form and skeleton of the seals; the crested seal, fig. 20, showing the curious male ornament of a cutaneous sac which can be inflated at will, the female possessing no such structure.

The Carnivora are found fossil in the eocene, tertiary, and in all subsequent deposits.

CARNOT, Lazare Nicolas Marguerite, born at Nolay, in Burgundy, 1753, was the son of the notary of that place. From his youth he exhibited an uncommon talent for the mathematical and military sciences, entered the corps of engineers, and rose in office by the favour of the Prince of Condé. He

published, afterwards, Mathematical Essays, which caused him to be elected a member of several learned societies. His eulogy on Vauban received the prize of the Academy of Dijon. At the beginning of the revolution he was captain in the corps of engineers. In 1791 he was appointed deputy to the constituent assembly, but at first took part only in military affairs. On his proposal the officers of the nobility were removed from the army, and others substituted from the citizens. He also proposed that implicit obedience should only be demanded of the soldier in presence of the enemy, at other times he should have all the privileges and rights of the citizen; a strange proposal to come from a military chief. As a member of the convention he voted for the death of Louis. In the following March he was sent to the *army of the north*, where he deprived the cowardly General Gratien of his command on the field, put himself at the head of the army, and repulsed the enemy. On his return to the convention he was made a member of the Committee of Public Safety (which see). The influence of Carnot in the military operations now began to be more deeply felt. In possession of all the plans deposited in the archives of Louis XIV., he organized and directed the French armies; and his direction undoubtedly contributed very much to their success. After the fall of Robespierre he was often accused, but always acquitted, because his duty had been to take care of the defence of the country, and he could not be made answerable for the cruel decrees of Robespierre, in which Carnot's name, as he was a member of the committee, was of course to be found. At the establishment of the directory in 1795 Carnot was chosen a member, and for some time maintained an important influence. Barras at length succeeded him in the department of war, and was ever after his enemy. His plan for the overthrow of Barras was unsuccessful, and with some others he was sentenced to transportation on the 18th Fructidor (Sept. 4), 1797. He fled to Germany and published a defence, which was eagerly read in Paris, and by the exposure of the conduct of his former colleagues hastened their overthrow on the 30th Prairial (June 18), 1799. After the 18th Brumaire Carnot was recalled, and appointed *inspecteur aux revues*, and two months later, in April, 1800, minister of war. He soon after retired into the bosom of his family, but was called to the tribunate March 9, 1802. The same inflexible integrity and republican principle which had hitherto distinguished him, did not now desert him. He often opposed the views of the government, voted against the consulship for life, and his was the only voice raised against the proposal for the imperial dignity. He remained, however, a member of the tribunate till it was abolished, passed the next seven years of his life in retirement, and published several valuable military works. In 1814 Napoleon gave him the chief command at Antwerp. He connected a vigorous defence with a careful regard for the interest of the city, which, by the command of Louis XVIII., he afterwards surrendered to the British General Graham. He still retained his titles and his honours, but as a firm republican he could never expect the favour of the court; particularly as, in his memorial to the king, he openly and severely censured the measures of government, in consequence of which he was passed over in the new organization of the Academy of Sciences. When Napoleon was once more at the helm of state in 1815, he made Carnot count and peer of the empire, and pressed upon him the ministry of the interior. Carnot discharged the difficult duties of this office with his usual integrity. After the emperor's second fall he was made a member of the provisory government of France, and was afterwards the only one of the members of it comprehended in the ordinance of July 24. He retired to Cerney, where he employed his pen on political subjects; then to Warsaw with his family; and finally to Magdeburg, where he died Aug. 2, 1823. Among Carnot's writings the most valuable are his Essai sur les Machines; Réflexions sur la Métaphysique du Calcul infinitésimal; Sur la Géometrie de Position; De la Défense des Places fortes; Exposé de la Conduite politique de Carnot, depuis le 1 Juill. 1814. In Magdeburg Carnot published Mémoire sur la Fortification primitive, and a volume of poems. He was rigid in his love of virtue, a scholar, a general, and an inflexible republican. He was universally esteemed, both in France and in foreign lands, and was honoured by all parties.

CARNOT'S PRINCIPLE. Sadi Carnot, a son of the republican war minister, published in 1824 his Réflexions sur la Puissance motrice du Feu. In it he announced the principle that is known in connection with his name. The following is a statement of it. Considering a perfect thermodynamic engine, the criterion of which is its reversibility (see THERMODYNAMICS), Carnot shows that the efficiency of such an engine is the greatest that can be obtained with a given range of temperature. The denial of perpetual motion in its most logical form follows directly from the principle. Sir William Thomson states the denial thus—It is impossible by means of inanimate material agency to derive mechanical effect from any portion of matter by cooling it below the temperature of the coldest of the surrounding objects. (For fuller information on this subject the article on THERMODYNAMICS must be consulted.) It follows from Carnot's principle that all reversible engines, whatever be the substance employed, whether, for example, an air-engine or a water-engine is used, have the same efficiency, provided that they work between the same temperatures of source and refrigerator.

CARO, ANNIBALE, one of the most celebrated Italian authors of the sixteenth century, born 1507, at Citta Nuova, in the March of Ancona. After the death of his patron Gaddi, 1543, he was appointed secretary to Pietro Ludovico Farnese, duke of Parma and Piacenza, who intrusted him with several missions to Charles V. After the assassination of the duke his own life was in considerable danger. He took refuge in Parma, and was treated in a friendly manner by the new Duke Octavio Farnese, whose two brothers, the cardinals Ranuccio and Alexander, took him successively into their service. With the latter he remained from 1548 to his death in 1566, and received from him several ecclesiastical preferments. Caro devoted himself chiefly to the study of numismatics and the Tuscan language, and his pure and elegant style in verse and prose soon became generally admired. His translation of the Æneid in blank verse is excellent. After his death appeared a translation by him of Longus, and of Aristotle's Rhetoric; also Rime and Lettere, the former of which are admired for the elegance of the verse, and the latter as models of beautiful Italian prose. He belongs to the most elegant writers of Italian literature.

CAROB-TREE, or ALGAROBA-BEAN (*Ceratonia siliqua*), a leguminous plant of the sub-order Cæsalpineæ, growing wild in all the countries bordering the Mediterranean, and more especially in the Levant. It has a dark-green foliage, and produces pods, in which the seeds are imbedded in a dry nutritious pulp, of the taste and consistence of manna. The names locust and St. John's bread have been given to the legumes of this plant, from an idea that they were the food eaten, along with wild honey, by the

Baptist in the wilderness. The legumes are sometimes imported into this country as food for horses, this being their principal use in the S. of Europe and the N. of Africa, where the plant is cultivated. Singers are said to chew the seeds for improving the voice.

CAROLI, Pietro Francesco, born at Turin in 1638, studied painting at Venice, Florence, and Rome, and was professor in the Academy of Rome at his death in 1716. He is celebrated for his careful execution and beautiful colouring, and excelled particularly in perspective, of his skill of which he has left excellent specimens in his drawings of the interior of some of the Roman churches.

CAROLINA. This name is generally given to a famous law of the German Empire, of the year 1532, under Charles V., which he himself called an ordinance of criminal procedure (*Peinliche Gerichtsordnung*). From him it was at a later period called *Constitutio criminalis Carolina*, or shortly *Carolina*. The arbitrary administration of justice, the disorder and cruelty which had become customary in the courts of Germany, where many a process was begun and ended with torture, and persons were sentenced even to death without regular process, gave occasion to this law. From the beginning of the *peace of the land* the necessity of such a law was felt throughout the country; but it was difficult in this, as in all other cases, to make the different members of the empire agree on one general measure. The Baron Johann von Schwarzenberg was chiefly instrumental in introducing this ordinance. He became minister of state of the Prince-bishop of Bamberg, and succeeded in procuring an ordinance of criminal procedure for Bamberg to be drawn up and published in 1507. The same was also adopted in 1510 by the margrave of Brandenburg and Franconia; and at last a law of criminal procedure for the empire at large was passed by the diet at Ratisbon, in 1532. The Carolina contains 219 articles, which regulate the standing and oaths of judges, the character of witnesses, the penalties of different crimes, and the circumstances in which torture at that time common in criminal jurisprudence should be applied. Several German princes, as the elector of Saxony, the elector of Brandenburg, and of the palatinate, protested against it, in order to protect the laws of their states and their own privileges against the legislative power of the emperor; but at last the *Carolina* was established in almost every part of the empire. From the connection of Switzerland with Germany, and the fact that several Swiss towns were imperial cities, German laws frequently passed into Switzerland, and the Carolina became the law by which even the Swiss troops in the service of the kings of France were governed until the French revolution.

CAROLINA, North, one of the United States, bounded N. by Virginia, E. by the Atlantic, S. by South Carolina and Georgia, and W. by Tennessee; lon. 75° 45′ to 84° 20′ W.; lat. 33° 50′ to 36° 30′ N.; 450 miles long, and 180 broad; area, 52,250 square miles, or about 33,440,000 acres, of which 22,639,644 are rented as farms. Pop. in 1790, 393,751; in 1880, 1,399,750, consisting of 867,242 white, 532,508 coloured (Negroes, Chinese, and Indians). In 1890 the pop. was 1,617,947, of whom 567,170 were coloured. The total in 1900 was 1,891,992. This state has no large towns. Raleigh, the seat of government, in Wake county, has a population of 12,678; Wilmington, the principal port, on Cape Fear river, 20,056. The legislative power is vested in a Senate and House of Representatives, chosen biennially. The Senate is composed of 50 members, and the House of Representatives of 120 members. The governor, lieutenant-governor, secretary of state. treasurer, and other chief state functionaries are elected by the people every four years. Every male citizen over twenty-one years, and who has resided a year in the state, is entitled to a vote. The principal rivers are the Roanoke and Chowan, falling into Albemarle Sound; the Neuse and Pamlico or Tar, falling into Pamlico Sound; Cape Fear, discharging itself at the cape of same name; and Yadkin and Catawba, flowing into South Carolina. Of these the Cape Fear affords the best navigation, and is ascended by vessels of 300 tons to Wilmington, and by steamboats to Fayetteville. The coast is generally difficult of access, being inclosed throughout the greater part of its extent by a long line of narrow sandy islands, separated from the mainland by sounds of various breadths, the passages between which are mostly shallow and dangerous. The two most considerable sounds on the coast are those of Pamlico and Albemarle. Dismal Swamp lies partly in North Carolina and partly in Virginia. Little Dismal or Alligator Swamp is between Pamlico and Albemarle Sounds. There are three noted capes on the coast, viz. Cape Hatteras, Cape Lookout, and Cape Fear, which are all dangerous to seamen.

North Carolina in its whole width, for about 60 miles from the sea, is generally a dead level, varied only by occasional openings in the immense forest with which it is covered. After traversing this tedious plain, we are at length relieved by the appearance of hills and mountains, from the summits of which we behold a beautiful country, which stretches west far beyond the range of vision, and is adorned with forests of lofty trees. In the most W. part there are two ranges of mountains rising to a height of 3000 feet, the more E. of which forms part of the Blue Ridge range. In the level parts the soil generally is but indifferent. On the banks of some of the rivers, however, and particularly the Roanoke, it is remarkably fertile; and in other parts of this champaign country glades of rich swamp, and ridges of oak land, of a black and fruitful soil, form an exception to its general sterility. That part of the state which lies W. of the mountains is for the most part remarkably fertile, and abounds with oak-trees of various kinds, walnut, elm, lime, and cherry trees, the last of which not unfrequently attain the size of 3 feet in diameter. The soil and productions in the hilly country are nearly the same as in the Northern States. Wheat, rye, barley, oats, and flax are the crops most generally cultivated, and seem to suit well the nature of the soil. Cotton is grown in large quantities in the sandy isles and the flat country; rice is also grown largely among the swamps. The chief staples, however, are Indian-corn, tobacco, and sweet-potatoes. Throughout the whole state Indian-corn and pulse of all kinds are abundant. Of live-stock by far the most numerous species is hogs, which are reared in great numbers. North Carolina abounds in iron ore of good quality; coal is also abundant. Copper and gold have been found in considerable quantities. The gold-mines, which at one time excited a good deal of interest, though they have never proved very productive, are found on the Yadkin and its branches, and extend over a district comprising about 1000 square miles. In almost any part of this territory gold may be found in greater or less abundance, mixed with the soil. It exists in minute grains or particles, and has been found in lumps of 1 or 2 lbs. weight. Of the plains in the low country the large natural growth is almost universally pitch pine, a tall and beautiful tree, which grows here to a size far superior to the pitch pine of the Northern States. This valuable tree affords pitch, tar, turpentine, and various kinds of lumber, which together constitute about one-half of the exports of

North Carolina. It is of two kinds, the common and the long-leaved. The latter differs from other pines, not in the shape, but in the length of its leaves, which are nearly half a yard long, and hang in large clusters. The trees in the low countries, both of North and South Carolina, are loaded with quantities of a long spongy moss, which, hanging in clusters from the limbs, gives the forests a singular appearance. The mistletoe frequently ingrafts itself upon the trees in the back country. In this part plums, grapes, blackberries, and strawberries grow spontaneously; also several valuable medicinal plants, as ginseng, Virginia snake-root, Seneca snake-root, and some others. The rich bottoms are overgrown with canes, the leaves of which continue green through the winter, and afford good pasture for cattle. North Carolina is far removed from that perfection of culture which is necessary to give it the full advantage of the natural richness of its soil and the value of its productions. One great cause of its backwardness in agricultural improvement is the want of inland navigation and of good harbours. It has several large rivers, but their mouths are blocked up with bars of hard sand. The best of the indifferent harbours in this state are those of Wilmington, Washington, and Newbern. The most of the produce of the upper country, consisting of tobacco, wheat, maize, &c., has hitherto been carried to Charleston, South Carolina, and to Lynchburg and Petersburg, Virginia. Since 1815 the state has been zealously engaged in an extensive system of internal improvements. These improvements relate to the navigation of the sounds, inlets, and the rivers Roanoke, Tar, Neuse, Cape Fear, Yadkin, Catawba, &c.; the construction of canals and roads, and the draining of marshes and swamps. More recently railways have been introduced, and there is now an extensive system of these running in various directions. The Western North Carolina with the Richmond and Danville, and the Midland North Carolina Railroads traverse the entire state, and local lines are being added from time to time as the traffic expands. Like all the Southern States, North Carolina has a considerable diversity of climate, occasioned by the different elevation and other physical peculiarities of its different parts. The difference of average temperature during the year between the E. and W. extremities amounts to no less than 5° Fahr. In the level part of the country intermittent fevers are frequent during the summer and autumn. Many fall victims during the winter to diseases of the chest. In the western and hilly parts the air is as pure and salubrious as in any part of America, and the inhabitants live to a great age. The heat of the summer's day is succeeded in the evening by a grateful and refreshing coolness. Autumn is temperate and serene, and in some years the winters are so mild that autumn may be said to continue till spring. The wheat-harvest commences in the beginning of June, and that of Indian-corn early in September. Agriculture and mining are the chief industries of North Carolina, and its commerce is mostly with the surrounding states. It possesses great natural facilities for manufacturing purposes in its immense water-power.

Historical Sketch of North Carolina.—In 1586 the first attempt was made by the English to colonize North America, under a patent to Sir Francis Drake. A small colony was left on the Roanoke in 1587, but was never again to be found; all attempts to ascertain its fate were fruitless. Some emigrants from Virginia penetrated into the country about 1650, and made the first actual settlement of whites. On the early Spanish maps what is now called Carolina had been marked as part of Florida. The French had given it the name of Carolina in honour of King Charles IX. when they made the disastrous attempt to colonize the North American coast, noticed under the head of FLORIDA. The name Carolina prevailed. In 1661 a second English colony from Massachusetts arrived, and established themselves at Cape Fear River. In 1667, after many vexatious struggles, the infant colony obtained a representative government. Two years later the fanciful constitution, so famous under the name of Locke's Scheme of Government, was introduced. This wild project was soon abandoned; and, like other English colonies, Carolina advanced but slowly, and experienced the horrors of Indian warfare as late as 1712. Previous to 1717 Carolina had been a proprietary government, but in that year became a royal one by purchase, and continued such until the revolution in 1775. In 1720 the two Carolinas were separated into North and South Carolina. By the Mecklenberg Declaration of Independence, May 20, 1775, North Carolina was the first state to propose a separation from Great Britain. Its inaccessible coast rendered it less liable to attack during the revolutionary war than most of the other Atlantic states. A convention was assembled at Halifax, where, on Dec. 18, 1776, the existing constitution was adopted. North Carolina seceded from the Union by an act passed May 20, 1861. The seaboard counties were reconquered in 1862, and the state readmitted to representation in Congress in June, 1868, slavery having been abolished.

CAROLINA, SOUTH, one of the United States, bounded N. by North Carolina, E. by the Atlantic, S.W. and W. by Georgia; lon. 78° 24' to 83° 30' W.; lat. 32° 2' to 35° 10' N. The form of the state is somewhat triangular, having a coast-line of 200 miles as a base, with a distance from the coast at its N.W. extremity of about 260 miles. Area, 30,570 square miles, or 19,564,800 acres, of which 13,535,237 are occupied as farms. Pop. in 1790, 240,000; in 1880, 995,577, being—whites, 391,105; coloured, 604,332; Indians, 131; Chinese, 9. In 1890 the population was 1,151,149, 692,503 being returned as coloured; in 1900 the total was 1,340,312. Columbia is the seat of government. The legislature consists of a Senate and House of Representatives. The Senate consists of 35 members, one for each county besides Charleston, which has two. The House of Representatives contains 124 members; senators and representatives are balloted for every second year in their respective districts. The governor and lieutenant-governor are chosen biennially by a joint ballot of both houses. The principal denominations of Christians in South Carolina are Presbyterians, Episcopalians, Baptists, and Methodists. Education is liberally patronized by the state government. The two principal literary institutions are the College of South Carolina, at Columbia, and Charleston College, in the city of Charleston. The distinguishing virtues of the Carolinians are hospitality to strangers, and charity to the indigent and distressed. Among the principal rivers are the Great and Small Pedee. The Great Pedee enters the state from North Carolina, where it is called the Yadkin; the Saluda and Broad rivers drain the N.W. of the state, and unite to form the Congaree, which, together with the Wateree, becomes a main affluent of the Santee. The Edisto and Combahee drain the S.W. of the state; the Savannah forms the boundary between South Carolina and Georgia. These and other streams, flowing generally in a S.E. direction, afford an inland navigation to the extent of 2400 miles. The coast possesses numerous inlets with sufficient depth of water to allow of an extensive coasting navigation. The principal harbour is that of Charleston, the entrance of which, however, is obstructed by a bar. Numerous small islands along the coast supply the famous Sea-island cotton.

South Carolina is divided by nature into two parts, which, from their physical situation, have been called *Upper* and *Lower Carolina*. The latter is supposed to have once been under the ocean. Towards the coast the country is a level plain, extending more than 100 miles westward from the sea. Here the eye finds no relief from the dull uniformity of boundless forests, swamps, and level fields. This fatiguing plain is succeeded by a curious range of little sand hills, resembling the waves of an agitated sea. This singular country occupies an extent of about 60 miles. It is extremely barren, enlivened here and there by spots of verdure, or by some straggling pines; and its few inhabitants earn a scanty subsistence by the cultivation of corn and sweet-potatoes. After passing these sand hills we come next to a remarkable tract of ground called the Ridge, which, on its approach from the sea, is lofty and bold, but on the N.W. is level from its summit. This is a fine belt of land, extending from the Savannah to Broad River, fertile, well cultivated, and watered by considerable streams. The country beyond the Ridge resembles, in its scenery, the most interesting of the Northern States. The traveller is gratified by the pleasant alternation of hill and dale. The lively verdure of the hills is contrasted with the deeper tints of the extensive forests which decorate their sides; and, in the valleys, broad rivers roll their streams through the varied beauties of luxuriant and cultivated fields. From these delightful regions the ground still continues to rise, till we reach the western limit of the state. Here seven or eight mountains run in regular direction, the most distinguished of which is Table Mountain, which has an elevation of 4000 feet above the level of the sea. These mountains are a part of the Blue Ridge range.—The soil of South Carolina is divided into six classes: (1) tide swamp; (2) inland swamp; (3) high river swamp, or low grounds, distinguished by the name of *second low grounds;* (4) salt marsh; (5) oak and hickory high land; (6) pine barren. The first two classes are peculiarly adapted to the culture of rice and hemp; the third is most favourable to the growth of hemp, corn, and indigo. The salt marsh has been much neglected. The oak and hickory land is remarkably fertile, and well adapted to the culture of corn, as well as indigo and cotton. The pine barren, though the least productive, is so much more salubrious than the other soils in the low country that a proportion of pine barren is an appendage indispensable to every swamp plantation.

The staple commodities of this state are cotton and rice, of which great quantities are annually exported. These articles have so engrossed the attention of the planters that the culture of wheat, barley, oats, and other crops equally useful, but less profitable, has been almost wholly neglected. So little wheat is raised throughout the state that considerable quantities are annually imported. Cotton was not raised in any considerable quantities till as late as 1795. Before that period indigo was, next to rice, the most important article of produce; but it is now neglected. Tobacco thrives well. The fruits which flourish best are pears, pomegranates, and water-melons; the latter, in particular, grow to an enormous size, and are superior, perhaps, to any in the world. Other fruits are figs, apricots, nectarines, apples, peaches, olives, almonds, and oranges.—The period of vegetation comprehends, in favourable years, from seven to eight months, commencing in January or February, and terminating in October or November. The frosts, generally, in the months of November, December, January, and February, are too severe for the delicate productions of more southern latitudes. The low country is seldom covered with snow, but the mountains near the western boundary often are. Frost sometimes binds up the earth, but seldom penetrates deeper than 2 inches, or lasts longer than three or four days. At some seasons, and particularly in February, the weather is very variable. The temperature has been known to vary 46° in one day. In Charleston, for seven years, the thermometer was not known to rise above 93° or to fall below 17° above zero. The number of extremely hot days in Charleston is seldom more than thirty in a year; and there are about as many sultry nights, in which the heat and closeness of the air are such as to prevent the enjoyment of sound sleep.—The low country is infested with all the diseases which spring from a warm, moist, and unelastic atmosphere. Of these the most frequent are fevers, from which the inhabitants suffer more than from any, or perhaps from all other diseases together. The districts of the upper country enjoy as salubrious a climate as any part of the United States. South Carolina manufactures cotton yarns and coarse cotton cloths to some extent The commerce is considerable. The chief exports are cotton, rice, timber, and naval stores. Of cotton the annual export amounts to between £3,000,000 and £4,000,000. There is a considerable net-work of railways extending over the state. Columbia, the capital, is an important railway centre, and Charleston, which is the chief seaport and commercial emporium, is the terminus of several lines.

Historical Sketch of South Carolina.—The first settlement of South Carolina by the whites appears to have been made at Port Royal about 1670; but, until 1680, no permanent establishment was formed, when the few settlers then in the country fixed on Oyster Point, between Ashley and Cooper Rivers, and laid the foundation of the city of Charleston. A grant had, however, been made, in 1662, previous to the founding of Charleston, by Charles II., to Lord Clarendon and seven others, of all that zone of North America from N. lat. 31° to 36°; and, two years afterwards, the boundaries were extended to N. lat. 36° 30′. The proprietary government of Carolina was, if possible, more complex than any other similar government in the English colonies. This confusion was augmented by the Platonic scheme of John Locke, the celebrated philosopher, who prepared a model constitution for the colony, and by religious contention, and was terminated in 1719 by a separation of the two Carolinas, and the establishment of a royal government. One of the events of most importance in the history of South Carolina was the cultivation of rice, introduced by Governor Smith in 1695: that of cotton followed; and the colony flourished until its progress was checked by war with the Indians, and subsequently by the revolution. South Carolina suffered severely in the latter contest, and was the theatre of some of the most remarkable events which it produced. The names of Marion, Sumter, and Lee conferred honour on the state. The existing government or constitution of South Carolina was adopted June 3, 1790, amended Dec. 17, 1808, and again Dec. 19, 1816. South Carolina was the first of the Confederate States to secede from the Union. The Secession Ordinance was passed at Charleston 20th Dec. 1860, and was followed by the first act of the war, the attack on the United States' Fort Sumter, which was taken on 14th April, 1861; and on the 19th April the blockade of the ports of South Carolina was declared by President Lincoln. South Carolina was readmitted to representation in the Congress of the United States on 11th June, 1868, slavery having been abolished by proclamation of President Lincoln, 1st Jan. 1863.

CAROLINE AMELIA ELIZABETH, wife of George IV., king of Great Britain and Hanover, second daughter of Duke Charles William Ferdinand of Brunswick (who was mortally wounded in the battle of Auerstädt), and of the Princess Augusta of England, sister of George III. She was born May 17, 1768. The young princess spent her youth in her father's court, under much constraint, till 1795, when she was married to the Prince of Wales, afterwards George IV. After the birth of her daughter, Charlotte Augusta (7th Jan. 1796), her husband abandoned her, declaring that no one could force his inclinations. This was the beginning of the disgraceful dispute between the two parties, which lasted till the death of Caroline, and exposed her honour to repeated accusations from her husband. The Princess of Wales lived retired from the court, at a country-seat at Blackheath, till 1808. Meanwhile many reports were circulated against her honour; on account of which the king instituted an inquiry into her conduct, by a ministerial committee. This committee acquitted the princess of any serious charge, declaring, at the same time, that she had been guilty of some imprudences, which had given rise to unfounded suspicions. The king confirmed this declaration of her innocence, and paid her a visit of ceremony. She afterwards received equal marks of esteem from the princes, her brothers-in-law. Public feeling was also manifested strongly in her favour. In 1813 the contest was renewed between the two parties, the Princess of Wales complaining, as a mother, of the difficulties opposed to her seeing her daughter. The Prince of Wales, then regent, disregarded these complaints. Upon this, in July 1814, the princess obtained permission to go to Brunswick, and afterwards to make the tour of Italy and Greece. She now began her celebrated journey through Germany, Italy, Greece, the Archipelago, and Syria, to Jerusalem, in which the Italian Bergami was her confidant and attendant. Many infamous reports were afterwards circulated, relating to the connection between the Princess and Bergami. On her journey she received grateful acknowledgments for her liberality, her kindness, and her generous efforts for the relief of the distressed. She afterwards lived in Italy, spending much of the time at a country-seat on Lake Como. When the Prince of Wales ascended the throne, Jan. 29, 1820, he offered her an income of £50,000 sterling, on condition that she should renounce the title of *Queen of England*, and every title appertaining to that dignity, and should not again return to England. She refused the proposal, returned to England on 5th June, and next day entered London amid public demonstrations of welcome. The minister, Lord Liverpool, now accused the queen before the Parliament as an adulteress. The bill of pains and penalties passed the House of Lords, but owing to popular disapprobation loudly expressed it was abandoned by the ministry. In this trial Brougham acted as the queen's attorney-general. Though banished from the court, the queen still lived at Brandenburg House, maintaining a style suitable to her rank. She was refused admission to Westminster Abbey on the occasion of the coronation of her husband, on 19th July, 1821, and published a protest in the newspapers. Soon after her husband's departure to Ireland, July 30, she was taken ill in Drury Lane Theatre. An inflammation of the bowels (*enteritis*) succeeded, and she died Aug. 7, 1821. The corpse, according to her last will, was removed to Brunswick, where it rests among the remains of her ancestors. Her tombstone has a very short inscription, in which she is called the *unhappy Queen of England*. Her conduct does not seem to have been irreproachable, but the much worse character of her husband, in respect to the offences of which she was accused, gained her an amount of public sympathy, enhanced by the advocacy of Brougham, which was unfavourable to an impartial investigation of the truth.

CAROLINE ISLANDS, or New Philippines (Spanish, *Carolinas*, *Filipinas-Nuevas*), a large archipelago, North Pacific Ocean, between lat. 3° and 12° N., and lon. 132° and 163° 6′ E., between the Philippines and the Marshall Isles. It contains numerous groups, while the individual islets which stud its surface are almost innumerable. Many of them are mere coral reefs little elevated above the ocean. The most westerly group is the Paloas or Pelew Islands, which contain seven large and many small ones, all of coralline formation. The next group, Yap or Gouap, lies N.E. of the last. In its chief island, which is mountainous, precious metals have been found. The other principal groups are Lutke, Mortlock, Siniavin, Enderby, and Hogoleu. The most easterly island is Ualan. The pop. is estimated at 23,600. The most important vegetable productions are palms, bread-fruit trees, and bananas. The inhabitants belong to different races, and have made very different degrees of progress in civilization. In the central groups they are of a handsome physical type, active and industrious, and have some commerce. On the E. generally, and on the W., with the exception of the Pelew Islands, the inhabitants, though apparently of the same stock, are far less advanced. The archipelago was first discovered by the Spaniards in 1543, and they appear to have then taken possession of the islands, though they did little to show that they considered them a Spanish possession till 1885, when Germany proposed to annex them, and hoisted the German flag at Yap. This led to a serious dispute, which, by the arbitration of the pope, ended in favour of Spain. In 1899 the islands were transferred to Germany in return for a substantial money payment.

CAROLINE LAWS. See Carolina.

CAROLINE MATILDA, daughter of Frederick Louis, prince of Wales, was born in 1751, married in 1766 King Christian VII. of Denmark, and died 10th May, 1775, at Celle, in Hanover. She became the object of court intrigues caused by the jealousy of the grandmother and stepmother of her husband. These led to the execution for treason of Counts Struensee and Brandt, who were of the queen's party, and to the imprisonment of the queen herself, who was liberated through the interference of her brother, George III. of England. Her last hours are described in a small work, Die letzen Stunden der Königin von Danemark.

CAROTTO.—1. Gian Francesco, a distinguished painter, born at Verona in 1470, studied under Liberale there, and under Andrea Montegna at Mantua. The harsh style of the latter is conspicuous in several of the pupil's earlier productions. At a later period the study of the works of Leonardo da Vinci and Raphael produced a very decided improvement. Carotto is not distinguished by the grandeur of his conceptions, but excels in character and expression, and in the softness and warmth of his colouring. The churches of Verona are adorned with many of his works. Of these the Archangel Michael, in the church of St. Eufemia is considered the finest. He died in 1546.——2. Giovanni, brother and pupil of the preceding, excelled as an architectural painter, and is celebrated for his copies of ancient ruins, a collection of which has been made and engraved. He is said to have given lessons to the great Paul Veronese. He died in 1555.—Another Carotto, a pupil of Pisanello, is known as one of the most eminent medalists of the fifteenth century.

CAROUSEL, Carrousel, formerly an exhibition of various knightly exercises, as riding at the ring, throwing the spear, &c., which were celebrated at the courts of princes on festival occasions with great pomp and splendour. They are very ancient, but are first mentioned in history in 842, on occasion of the meeting held by Charles the Bold and Lewis the German. They were superseded by tournaments, but when these had fallen were again revived. The victor, as in tourneys, received his reward from the hands of the fair, who sometimes even took part in the games. The introduction or revival of the carousels in France took place after tournaments had fallen out of fashion in consequence of the accident which ended in the death of Henry II. The first great carousels were given in 1605, at the Hôtel de Bourgogne. Similar fêtes had already long existed among the Moors, Spaniards, and Italians. It was from the last-named people the idea was taken up by the French. These exhibitions were frequent during the continuance of the old French monarchy, on the occasion of the marriages of princes and princesses, births, victories, and other occasions of public rejoicing. During the reign of Louis XIV. they were frequently given in honour of the mistresses of the king. The Place du Carrousel in Paris was so called from one of these fêtes given there in 1662, in honour of Mademoiselle de la Vallière. The greatest extravagancies were enacted at these displays. The king figured in the one just mentioned in Roman costume. Monsieur (his brother) 'commanded the Persians', the Prince of Condé the Turks, the Duke d'Enghien the Indians, the Duke of Guise the Americans, and so on. The greatest profusion of expenditure in artificial scenery, costumes, and accessories prevailed on these occasions, and the eyes of the courtiers were dazzled with a magnificence which the public purse was freely drawn upon to provide. Recitations formed an accompaniment of these fêtes. Some piece of verse composed in the most outrageous taste, and full of allegorical personages, absurdly conceived and fantastically grouped, was usually recited in honour of the heroine of the fête. Sometimes dramatic spectacles of greater merit than the foolish displays in which the grandees themselves indulged, were given by professional actors, and the genius of Molière was thus frequently called into requisition.

CARP (*Cyprinus*), a genus of soft-finned abdominal fish, which Cuvier makes the fourth family of the order. This is a very well defined genus, containing very numerous species. It is easily distinguished by the small mouth, toothless jaws, and gills of three flat rays. The tongue and palate are smooth, but the gullet is admirably constructed for mastication, having large teeth attached to the inferior pharyngeal bones, which press the food between themselves and a gelatinous knob connected with a bony plate that is united with the first vertebra, commonly called the carp's *tongue*. They have but one dorsal fin, and the body is covered with scales, generally of large size. They frequent fresh and quiet waters, feeding on herbs, grains, and even mud, being, perhaps, the least carnivorous of the finny race. Some of the species have a beard of small fleshy threads at the angles of the upper jaw. The subgenera are *Cyprinus*, the true carps; *Barbus*, the barbels; *Tinca*, the tenches; and several others, chiefly foreign. The most noted of the species are the common carp, olive green above and yellowish below (*C. carpio*, L.), which, in many parts of the world, are bred in ponds for the use of the table; and the goldfish (*C. auratus*), believed to be originally from China, very commonly bred in ponds and vases as an ornament, on account of its beautiful colours. These are black when young, and acquire gradually the metallic tints for which they are so much admired. In his memoir on American Ichthyology, Dr. Mitchill enumerates four species of carp, under the names of *C. teres*, fresh-water sucker; *C. oblongus*, chub of New York; *C. chrysoleucus*, New York shiner; and *C. atronasus*, brook minnow. The common carp of Europe is esteemed very highly for stocking ponds, being of quick growth, spawning thrice a year. As the females do not commence breeding until eight or nine years old, it is necessary to keep up a supply of carp of that age by not destroying the females. The proportion of males to be preserved is four for every twelve females. Under common circumstances the carp grows 2 or 3 inches in length in a year; but where the ponds are exceedingly well supplied with food, they have been known to grow from 5 to 18 inches in the same time. They thrive best in ponds having clayey or marly sides, and well provided with aquatic vegetables. In order to furnish them with fresh vegetable food, it is usual to rake the sides of the pond, left dry by evaporation, with an iron rake, and then to sow grass seed, so that when the pond is again filled up by the rains there may be a growth of tender herbage for the fish. Grains of various sorts, and garbage, are frequently thrown into the pond, with a view to aid in fattening carp. A pond of one acre in extent is said to be sufficient to feed 300 carp of two or three years, or 400 of one year old. Carp, in their native condition, frequent the deepest places of ponds or rivers, where there is the least current. It is a fish which requires much patience and address in the angler. They seldom bite in cool weather, but during hot seasons bite very freely. The bait commonly used in angling for carp is worms, and sometimes grasshoppers. Various sweet pastes are also used, formed of honey or sugar, mingled with flour and small quantities of veal, pounded together in a mortar till sufficiently tough to adhere to a hook without being easily washed off. A little white wool mixed with the other ingredients is of great assistance in giving the mass the requisite tenacity. To increase the pleasure and profit of carp fishing, it is well, for a few days previous, to have some brewer's grains or other food thrown into the water, by which the fish will be induced to collect at any particular place in greater numbers. See Pl. II., fig. 14, at Ichthyology.

CARPACCIO, Vittore, one of the most celebrated masters of the old Venetian school, was the rival of Bellini and the last Vivarino, was born probably at Venice about 1450–55, and died there after 1521. All that is known of his life is that he belonged to Venice, of which he has reproduced in the back-ground of his pictures the streets and monuments. His distinguishing characteristics are natural expression, vivid conception, correct arrangement, and great variety of figures and costumes. He also excelled as an architectural and landscape painter. His favourite employment was the dramatic representation of sacred subjects, several of which he has illustrated by a series of paintings. Of these the most celebrated are the histories of St. Ursula and St. Stephen. The former, consisting of nine pictures, is now in the Academy at Venice, and has been engraved; the latter, in five pictures, is in Paris, Milan, and Berlin. The Madonna and Child Enthroned, supposed to be an earlier production, is in the National Gallery, London. He died in 1525.—Benedetto Carpaccio, a son or grandson of the above, flourished about the middle of the sixteenth century, and is known for a fine painting of the Coronation of the Virgin in the church of Capo d'Istria.

CARPATHIAN (or Karpathian) **MOUNTAINS** (German *Karpathen*), a range of mountains in Central Europe, forming for the greater part of their extent a natural boundary of Hungary, beginning at Orsova on the Servian frontier, separated from the Balkan by the Danube, and proceeding N.E. and then E. to the frontiers of Moldavia, where it trends first N.W., then W., and finally S.W. as far as Presburg, forming a semicircular belt of nearly 800 miles in length. Its breadth is considerable, reaching a maximum of 240 to 250 miles, between the Banat and Transylvania. The Carpathian chain may be divided into two great sections, the East and the West Carpathians, the former curving from the mouth of the Nera, which falls into the Danube 41 miles E. Belgrade, to the source of the Theiss, and forming the boundary between Austria and Roumania, the latter proceeding from the sources of the Theiss and the Pruth, and terminating on the banks of the Danube W. of Presburg, and forming the boundary between Hungary and Galicia. To the Western Carpathians belongs the remarkable group of the Tatra, in which is situated the culminating summit of the whole system, the Gerlsdorf Peak, 8721 feet. Several other peaks exceed 8000 feet. The loftiest summit of the Eastern Carpathians reaches an elevation of 8318 feet. The most remarkable and frequented passes are those of Teregova, leading from Orsova to Temeswar; of Vulkar, forming the valley in which the Schyl flows; and of the Rothenthurm, in a gorge formed by the Aluta at the foot of Mount Szurul. The outer bend of the Carpathians is much steeper than that which descends towards the valleys of Transylvania and Hungary. The only important rivers which actually rise in the chain are the Vistula, the Dniester, and the Theiss. The E. part of the Carpathian chain, from Orsova to the source of the Burcza, near Kronstadt, is entirely composed of primitive rocks. These are succeeded by grauwacke, which extends to the sources of the Theiss, and is only interrupted by a primitive group between the pass of Borgo and the source of the Viso. A great chain of trachyte appears on the frontiers of the Bukowina, and stretches to the point where the Aluta begins to flow S.W. To the W. of this chain, on approaching the plains, an extensive tract of sandstone belonging to the coal formation begins to appear, and covers the greater part of Transylvania. Tertiary formations surround the vast plains of Hungary, which consist of a rich alluvium, and must once have been the bed of a lake. Basalt frequently occurs, but no distinct traces of extinct volcanoes have been found. The Carpathian range is rich in minerals, including gold, silver, quicksilver, copper, and iron. Salt occurs in beds, which have sometimes a thickness of 600 or 700 feet, and are apparently inexhaustible. Vegetation also is vigorous. On the plateaux corn and fruit are grown to the height of 1500 feet. Higher up the mountain steeps are covered with forests of pine, some of them as high as 5500 feet. About 6000 feet seems to be the vegetable limit. Above it a few lichens may be found, but in general nothing is seen but bare, steep rocks, many of them in the form of conical peaks.

CARPENTARIA, GULF OF, a large gulf on the N. coast of Australia, having Cape York Peninsula, the northern extremity of Queensland, on the E., and Arnhem Land on the W. It contains Groote Eylandt, Sir Edward Pellew Islands, Wellesley Islands, &c. Its maximum width is about 400, length about 460 miles. The land round it is generally low.

CARPENTRAS (ancient *Carpentoracte*), a town, France, department Vaucluse, 14 miles N.E. of Avignon, with 7589 inhabitants in 1891. It stands in a fertile and pleasant district on a rising ground at the foot of Mount Ventoux, and is well built, though the streets are somewhat narrow. Under the Romans it was a place of importance, and possessed many handsome edifices, of which the subsequent ravages of Goths, Vandals, Lombards, and Saracens have left few traces. The principal structures are an aqueduct, which crosses the valley of the Auzon by forty-eight arches; a Roman triumphal arch, a Gothic cathedral, with an ancient spire, and the library, containing 25,000 volumes. As the entrepôt for the productions of the surrounding districts Carpentras has a considerable trade, and weekly markets, which are among the most important in the S. of France. Carpentras was formerly the seat of a bishopric. Pope Clement V. made it his residence in 1313. Carpentras furnishes many jokes to the Charivari and other humorous prints of Paris on account of its supposed Bœotian manners.

CARPENTRY is the art of combining pieces of timber to support a weight or sustain pressure. The work of the carpenter is intended to give stability to a structure; that of the joiner is applied to finishing and decoration. The scientific principles of carpentry are founded on the doctrines of the composition and resolution of mechanical forces, and a knowledge of these doctrines, either theoretical or practical, is indispensable to the skilled carpenter. To go into the principles of the art would be merely to explain a particular application of these mechanical forces, which would be beyond the scope and limits of this work. An explanation of the terms employed in carpentry may, however, be useful to the general reader. The term *frame* is applied to any assemblage of pieces of timber firmly connected together. The points of meeting of the pieces of timber in a frame are called *joints*. *Lengthening* a beam is uniting pieces of timber into one length by joining their extremities. When neatness is not required this is done by *fishing*. In this mode the ends of the beams are abutted together, and a piece of timber placed on each side and secured by bolts passed through the whole. Sometimes the parts are indented together, and pieces termed *keys* are notched into the beams and side pieces. When it is desirable to maintain the same depth and width throughout the beam *scarfing* is employed. This is cutting from each beam a part of the thickness of the timber, of the length of the intended joint, and on opposite sides, so that the pieces may be jointed together, and bolted or hooped. In bolting scarfs side plates of iron are used to protect the wood. When greater strength is required than can be produced by a single beam *building* and *trussing* beams are resorted to. Building beams is combining two or more beams in depth so as to have the effect of one. In trussing the beam is cut in two in the direction of its length, and supported with cross-beams, as in roofing. *Mortise* and *tenon* is a mode of jointing timber. An excavation called the mortise is made in one piece, and a projecting tongue to fit it called the tenon in the other. The tenon is confined in the mortise by a pin penetrating it laterally through the side of the mortised beam, or by an external strap of iron passing round the mortised beam and rivetted in the one terminating in the tenon. The timber framework of floors is called *naked flooring*. It is of three kinds—single, double, and framed. Single flooring consists of a series of joists stretching across the whole void from wall to wall without an intermediate support. The flooring boards are laid on the top of these, and the ceiling of the lower story fixed to the under side. Double flooring consists in laying binding joists across the floor about 6 feet apart, crossed above by bridging joists, and also crossed below by the ceiling joints. Framed flooring is provided with girders or beams in addition to the binding, bridging, and ceiling joists. To prevent the transmission of sound a double ceiling of lath and plaster is sometimes used, but generally pugging is inserted between the roof and the ceiling. This in Scotland is called deafening. *Cornice bracketing* consists in rough wooden profiles of the room cornices, which are afterwards lathed round and plastered. Partitions, when not required to bear weight, are formed by laying along the floor a piece of timber called a *sill*, together with a corresponding piece along the ceiling joists, the space within being filled with vertical pieces called *quarters*, to which the lath is nailed. When the partition has weight to support it has to be trussed with posts and braces. The timbers which support the steps of a wooden staircase are termed the *carriage*. They consist of two pieces of timber inclined to the *rake*, or projection of the steps, and termed *rough strings*, which may rest upon a piece of timber projected horizontally from the upper wall called a *pitching* or *apron* piece, which also supports the joists of the landing or *half pace*. The *roof* is the framework by which the covering of a building is supported. It may consist of a series of pieces of timber with their one ends resting on the opposite walls, and their other ends meeting in a point, which are called *rafters*. When loaded with the weight of the covering this framework would be apt to thrust out the roof; a third piece is consequently added, which, like a string, connects the lower extremities of the rafters, and prevents them from spreading. This is called a *tie*, and the whole frame a couple. When the tie is of such a length that it is apt to droop in the middle, or *sag*, by its own weight, a fourth piece is added to unite it directly with the apex of the rafters; this is called the *king-post*. If the rafters too are liable to sag, cross pieces called *struts* are introduced, uniting their centres with the centre of the tie. Instead of the king-posts and struts the centre of each rafter may be joined to the tie by a piece falling perpendicularly on the latter, and to each other by a piece running across parallel to and above the tie, forming a parallelogram with the perpendiculars and the section of the tie inclosed by them. The suspending pieces are called *queen-posts*, and the horizontal one a *collar-beam*. The whole frame, constructed in either way, is called a truss. The trussed frames are placed at intervals of about 18 feet apart, and support horizontal pieces called *purlins*, which run the whole length of the roof, and support the common rafters with their covering.

CARPET, a thick fabric, generally composed wholly or principally of wool, for covering the floors of apartments, staircases, and passages in the interior of a house. Carpets are a luxury now nearly indispensable in European habitations, and have superseded both the bare stone or wood pavements, and the straw or rush coverings of earlier and ruder ages. They were originally introduced from the East, where they were fabricated in pieces, like the modern rugs, for sitting on—a use obviously suggested by the eastern habit of sitting cross-legged upon the floor. The most beautiful carpets were brought into Europe from Persia and Turkey; but the manufacturers of Belgium, France, and Britain have now excelled the workmanship of their eastern teachers, though the best kinds of eastern carpets are unsurpassed in their own way. Such are still highly thought of in Europe, into which they are largely imported. The Persian, Turkish, and Indian carpets are all woven by hand, and the design is formed by knotting into the warp tufts of woollen threads of the proper colour one after the other. Of European carpets the *Brussels* carpet is a common and highly-esteemed variety. It is composed of linen or hempen thread and worsted, the latter forming the pattern. The linen basis does not appear on the surface, being concealed by the worsted, which is drawn through the reticulations and looped over wires that are afterwards withdrawn, giving the surface a ribbed appearance. Such carpets differ in thickness according to the number of layers of woollen threads woven into it, causing it to be spoken of as 'six-frame,' 'five-frame,' &c., carpet. These carpets are woven on a kind of Jacquard loom. *Wilton* carpets are similar to Brussels in process of manufacture, but in them the loops are cut open by using wires with a knife-edge, and the surface thus gets a pile. *Tapestry* carpets have also a pile surface. They are manufactured according to a process patented by Mr Whytock of Edinburgh in 1832, the great speciality of which is that the threads are particoloured by printing in the proper manner for each design before being woven up. The *Kidderminster* or *Scotch* carpet consists of two distinct webs woven at the same time and knitted together by the woof. The pattern is the same on both sides of the cloth, but the colours are reversed. An improvement upon this is the three-ply carpeting, made originally at Kilmarnock. The original *Axminster* carpets were made on the principle of the Persian or Turkey carpets. Patent Axminster carpets (invented by Templeton of Glasgow, 1839) have a fine pile, which is produced by using chenille as the weft, the projecting threads of which form the pile, which is dyed before being used. Carpets of felted wool, with designs printed on them, are also used, and are very cheap. Cheap jute carpets are also made.

CARPI, a town of Italy, in the province and 9 miles N. of the city of Modena, on the railway from Mantua to Modena; seat of a bishopric, suffragan to Bologna. It is surrounded by walls, defended by a citadel, and has a cathedral, a seminary, and manufactures of straw hats and spun silk. The neighbourhood produces rice, wheat, hemp, and flax. Pop. 6500.

CARPI, GIROLAMA DA, a painter of the sixteenth century, a native of Ferrara, painted many pictures for the churches there and at Bologna. He was a great admirer of Correggio and Parmegiano, whose works he copied with great success. He died in 1556.

CARPI, UGO DA, an Italian wood-carver who flourished in the beginning of the sixteenth century; said to have been born in 1455 at Carpi, and died in 1523. He is generally considered as the inventor of that species of carving denominated *chiaroscuro*. He was preceded in the art by Albert Dürer and Lucas Cranach (see these articles).

CARPZOV, a family which has furnished several eminent jurists and theologians. The founder of the family was Simon Carpzov, burgomaster of Brandenburg, in the middle of the sixteenth century. He had two sons: Joachim, who at his death at Glückstadt in Holstein, in 1628, was commander-in-chief of the Danish army; and Benedict, born, 1565, who was appointed professor of law at Wittenberg in 1595, became chancellor of the Dowager-electress Sophia at Kolditz, afterwards returned to Wittenberg, and died in 1624. A second Benedict, son of the former, born at Wittenberg in 1595, became assessor of the supreme court and professor of law at Leipzig in 1645, then councillor of the court of appeal and member of the privy-council at Dresden, and died in 1666. He was one of the most eminent jurists of his day, and is the author of several valuable legal works; but he is justly censured for the severity and cruelty of his proceedings. He is said to have signed the death-warrants of not fewer that 20,000 persons, and read the entire Bible through fifty-two times.—JOHANN BENEDICT CARPZOV, his brother, born at Rochlitz in 1607, became professor of theology at Leipzig, and is famed as the author of the Systema Theologicum (two vols. Leipzig, 1653). He died in 1657, leaving five sons, one of whom, Johann Benedict, born in 1639, became professor of theology and pastor of St. Thomas' church at Leipzig, distinguished himself by his knowledge of Hebrew language and literature, and translated several rabbinical works. He died in 1699.—Another member of the family, **Johann Gottlieb Carpzov**, born at Dresden in 1679, became professor of oriental languages at Leipzig, and died as superintendent at Lübeck in 1767. He was one of the most eminent theologians of his time, and wrote, among other treatises, Critica Sacra Veteris Testamenti (Leipzig, 1728); Introductio in Libros Canonicos Veteris Testamenti; &c.

CARRACCI, Lodovico, Agostino, and Annibale, Italian painters, the three founders of the Bologna, or, as it has also been called, the eclectic school of painting.

Lodovico, son of a butcher, born 1555 at Bologna, appeared at first to be more fit for grinding colours than for transferring them to canvas. But his slowness did not, in fact, arise from deficiency of talent, but from zeal for excellence. He detested all that was called ideal, and studied only nature, which he imitated with great care. At Florence he studied under Andrea del Sarto, and enjoyed the instruction of Passignano. He went to Parma for the purpose of studying Correggio, who was then imitated by almost all the Florentine painters. At Bologna he endeavoured to gain popularity for his new principles among the young artists, and united himself with his relatives, Agostino and Annibale Carracci, whom he sent in 1580 to Parma and Venice. In 1589 they established an academy for painters at Bologna, called the Academia degli Incamminati (from *incamminare*, to put in the way), which they directed jointly till 1600, the year of the departure of Agostino and Annibale for Rome. From that time till his death Lodovico was sole director. The academy was so successful that similar institutions in Bologna had to be closed. Among his most famous pupils were Domenichino and Guido Reni. His first principle was, that the study of nature must be united with the imitation of the best masters. He soon gave an example of this principle in his Prophecy of John the Baptist, in the monastery of the Carthusians, imitating in single figures the style of Raphael, Titian, and Tintoretto. The finest works of Lodovico are in Bologna, especially in the picture gallery or *Pinacoteca*, and among them are The Annunciation, The Transfiguration, and St. George and the Dragon. He excelled in architectural views and in drawing, and in general was very thorough in all the branches of his art. He executed several fine engravings. Lodovico died in 1619.

Agostino was born in 1557, at Bologna, his father being a cousin of the father of Lodovico. He soon became one of the most accomplished disciples of Lodovico, and excelled particularly in invention. He engraved more pieces than he painted, in order to please his brother Annibale, who became envious of his fame after one of Agostino's pictures had obtained a prize in preference to one of his own, and another excellent picture—the Communion of St. Jerome—had gained his brother universal admiration. In 1600 Agostino accompanied Annibale to Rome, and assisted him in painting the Farnesian Gallery. As many persons said that the engraver worked better than the painter, Annibale removed his brother under pretext that his style, though elegant, was not grand enough. Agostino went then to the court of the Duke of Parma, and painted there a picture representing the heavenly, the earthly, and the venal love. There was only one figure wanting when, exhausted by labour and mortification, he died in 1602. He wrote a treatise on perspective and architecture. As an engraver he deserves great praise, and often corrected the imperfect outlines of his originals. Among his engravings are many obscene ones, which have become rare.

Annibale, brother of the foregoing, born 1560 at Bologna, worked at first with his father, who was a tailor. By the advice of his cousin Lodovico he learned drawing, and made the most astonishing progress, copying first the pieces of Correggio, Titian, and Paul Veronese, and painting, like them, small pictures, before he undertook large ones. In the academy founded by the Carracci he taught the rules of arrangement and distribution of figures. He is one of the greatest imitators of Correggio. His St. Roque distributing Alms, now in Dresden, was the first painting which gave him reputation. His Genius of Glory is likewise celebrated. In the Farnesian Gallery at Rome, which he painted (1600–4), there breathes an antique elegance and all the grace of Raphael. You find there imitations of Tibaldi (who painted at Bologna about 1550 with Nicolo del Abate), of Michael Angelo (the style, indeed, somewhat softened), and the excellencies of the Venetian and Lombard schools. Out of Bologna he is acknowledged as the greatest of the Carracci. In that city, however, Lodovico is more admired. Agostino, perhaps, had more invention, and Lodovico more talent for teaching; but Annibale had a loftier spirit, and his style is more eloquent and noble. He died at Rome in 1609, and was buried at the side of Raphael in the Pantheon. His best picture is that of The Three Maries, now at Castle Howard.

CARRAGEEN, or Irish Moss (*Chondrus crispus*), a sea-weed of the order Florideæ, very common on rocky coasts, and especially abundant on the western side of Ireland. The frond is thick, cartilaginous, somewhat fan-shaped, and repeatedly forked; colour, various shades of purple or greenish. It is gathered from the rocks, washed, bleached in the sun, and dried, and is then the Irish moss of the shops. In hot water it swells up, and on boiling it dissolves. The results of the analysis of Irish moss are somewhat discordant; but the main constituent is a mucilage, which differs from gums, starches, and jellies by not giving their characteristic reactions. It is nutritious, and is substituted for animal jelly and starches in the preparation of soup, jellies, creams, and similar dishes. It is of value in pulmonary troubles, and is also used by painters and others in the preparation of size.

CARRARA, a city of Northern Italy, province Massa Carrara, 59 miles s.w. of Modena, about 16 miles from the sea. It has some fine churches, an academy of the fine arts, a marble statue of Garibaldi, and is surrounded by marble hills, which have made it celebrated. Most of the inhabitants are employed in, or in connection with, the quarries (see next article). The blocks of marble are brought from the quarries in ox-wagons, or by means of the Ferrovia Marmifera (Marble Railway). The marble is shipped at the port of Avenza. Sculptors make Carrara their residence to save the expense of carriage of marble. Pop. 12,000.

CARRARA MARBLE, so called from the town of Carrara, in Northern Italy (see above), is the variety of marble generally employed by statuaries. This is a white limestone, sometimes containing blue veins, and occurs in strata of considerable thickness and at a high angle of inclination. Carrara marble, which was formerly supposed to be a primitive limestone, is now considered an altered limestone of the oolitic period. The plutonic action to which it has been subjected has served to obliterate the traces of fossils. The mountains containing the marble are situated a few miles from the sea, and reach the height of 1500 feet. The quarries, in which about 5000 men are employed, are about halfway up the mountains, and though they have been worked for 2000 years, having furnished the material for the Pantheon at Rome, the supply is still practically inexhaustible. There are altogether about 400 quarries. Those supplying the pure white marble used for statuary are the most valuable. They are about twelve in number, belong to the principal families in Carrara, and are very productive. English machinery is now used in quarrying.

CARREL, ARMAND, a French writer and politician of the republican party, born at Rouen in 1800, and educated at the military school of St. Cyr. He entered enthusiastically into several of the secret political societies which were numerous in France after the restoration of the Bourbons. In 1819, when lieutenant of the garrisons of Belfort and Neubreisach, he became implicated in a conspiracy, and though his conduct escaped investigation he was removed with his regiment to Marseilles. An indolent garrison life accorded little with his restless spirit, and he resigned his commission to take an active part in the politics of his time. In 1823, when a French army, under the Duke d'Angoulême, was preparing to cross the Pyrenees, with the view of overturning the Spanish constitution, Carrel hurried to Barcelona, and joined the volunteer troop of French and Italian deserters which had been formed by Mina. On the capitulation which took place, he was carried back to France as prisoner of war, tried by a court-martial for having borne arms against his country, and condemned to death. A flaw in the judgment saved him, and though again twice tried he was ultimately acquitted. Having now settled in Paris, he zealously prosecuted his historical and political studies, and became intimate with Thiers, Mignet, and Augustin Thierry, particularly the last, under whose superintendence he wrote a Summary of the History of Scotland, which, though hastily written, met with great success. In 1827 he published a History of the English Revolution, and in 1830 united with Thiers and Mignet in editing the National, which soon rose to be the leading opposition newspaper. After the revolution his colleagues joined the government, and he was left with the chief direction of the paper, which still continued in opposition. He acquired great reputation by the vigour of his resistance to arbitrary government. In 1832 the National became openly republican, and he displayed considerable oratorical powers when compelled to defend it at the bar of the tribunals, and of the House of Peers. So great was its popularity that a fine of 10,000 francs imposed on it was paid in two days by a voluntary subscription, in which persons of all shades of opinion joined. He was killed in 1836 in a duel with Emile de Girardin. He has been called the Bayard of republican journalism. A monument by David has been erected to him in the church-porch of the town of St. Mandé, where he died.

CARRERAS, the name of three brothers, distinguished in the revolution of Chili—José Miguel, Juan José, and Luis. They were the sons of a rich landholder in Santiago, Don Ignacio Carrera. One of them served in Europe until 1811, and attained the rank of lieutenant-colonel and commandant of a Spanish regiment of hussars. The three brothers took an active part in the revolution from its commencement, and in Nov. 1811 obtained the effective control of the revolutionary government, and continued in the possession of power until 1813, when they were taken prisoners by the Spaniards. They were succeeded in power by O'Higgins and San Martin. Two of the brothers, Juan José and Luis, were apprehended in 1817 near Mendoza, on a political charge, and having been first induced to attempt an escape, were brought to trial and executed on the 8th of March, 1818. San Martin sent an account of the charges of their execution to their father, who paid it, and died two days afterwards of a broken heart. José Miguel raised a body of troops to revenge their death, and a conspiracy was formed in his favour; but it was detected and suppressed, and he himself being defeated and taken prisoner, was executed in 1822, on the same spot as his brothers.

CARRICK, the southern district of the shire of Ayr in Scotland. The surface is mountainous; but in the valleys and along the shores of the Atlantic the ground is level, with a fine clay or loamy soil. It became the property of Robert Bruce, father of the Scottish king of that name, by his marriage with the heiress of the earls of Carrick; and this title is still royal, being assigned to the eldest sons of the kings of Great Britain.

CARRICKFERGUS, a seaport of Ireland, co. Antrim, a mun. bor. and county of itself, 10 miles by railway N.E. of Belfast. It comprises an area of 16,700 acres, of which only 129 are in the town. The Bay of Carrickfergus is a small indentation on the north side of Belfast Lough. It is memorable in history as the landing-place of King William III., who disembarked on its shore at the quay of the town of Carrickfergus, on the 14th of June, 1690. The castle stands upon a rock projecting into the bay, and is still maintained as a fortress, having a number of guns on the walls and a small garrison. The public buildings besides the Episcopalian, Roman Catholic, and other churches, are a town-hall, court-house, market-house, &c. It has some trade, and carries on the linen manufacture, rock-salt mining and salt making, and fisheries. Vessels of 100 tons can discharge at the quay, and there is a patent slip where vessels are built and repaired. There is also a harbour admitting vessels of 500 tons. Railways go to Larne and Belfast. Pop. in 1881, 10,009; in 1891, 8923.

CARRICK-ON-SUIR, a town, Ireland, county Tipperary, 85 miles S.W. of Dublin, on the Waterford and Limerick Railway. It stands on the left bank of the Suir, which is here navigable by vessels of 200 tons, and has a considerable export of corn, butter, bacon, and live-stock; and linen and flax manufactures are carried on to some extent. There is one principal street parallel with the river, and crossed by three smaller streets. An iron bridge across the river from the centre of the town was opened in 1881. The fine old abbey of Carrick-Beg is situated in a suburb on the opposite side of the river. Pop. in 1881, 6583; in 1891, 5608.

CARRIER, is a person who undertakes to transport the goods of other persons from place to place for hire. Persons who undertake this responsibility regularly as a systematic business are called *common carriers*, and come under special legal regulations, by which their rights on the one hand and their privileges on the other are defined. Carriers' law has been considerably complicated by the introduction of railways, and the numerous and intricate claims arising out of their operations. The laws by which in Great Britain the obligations of carriers are mainly determined are the acts 11 George IV. and 1 William IV. cap. lxviii., and act 28 and 29 Vict. cap. xciv., amending the precited act. Common carriers are by these acts relieved of liability for loss of certain specified articles beyond the value of £10, excepting in case of the personal default of the carrier, or felony of his servants, unless the value of the goods be declared and an extra rate for insurance paid. Notice of the increased rates required must be affixed in the office of the carrier. Beyond the exemption given by this act carriers cannot protect themselves from liability for loss of articles conveyed by them by any notice, but they may do so by a special contract with the person employing them. The specified articles above referred to are 'gold or silver coins of this realm, or of any foreign state, or any gold or silver in a manufactured or unmanufactured state, or any precious stones, jewellery, watches, clocks, or time-pieces of any description, trinkets, bills, notes of the Governor and Company of the Banks of England, Scotland, and Ireland respectively, or of any other bank in Great Britain or Ireland, orders, notes, or securities for payment of money, English or foreign stamps, maps, writings, title-deeds, paintings, engravings, pictures, gold or silver plate or plated articles, glass, china, silks in a manufactured or unmanufactured state, and whether wrought up or not wrought up with other materials, furs, or lace [not being machine-made lace]'. Carriers of passengers, including the railway companies, are bound to receive all passengers who are in a fit condition to be carried, if there is proper convenience for carrying them and the passengers are willing to pay the fare; but they are liable only for negligence and not as insurers. The greatest care for the safety of the passengers must be exercised, but immunity from accident is not guaranteed. Railway companies are bound to make every effort to secure that trains shall arrive at their scheduled times, and they may be held liable for a long and unusual delay. They are also bound to carry a certain weight of personal luggage with each passenger, and in respect of this they have the same liability as common carriers, but in respect of luggage in the compartment with the passenger they are only liable for loss or injury caused by the negligence of their servants. The liability of a railway company in respect of animals is limited to £50 for a horse, £15 per head for neat cattle, and £2 per head for sheep or pigs, except when the value has been declared and extra payment made. No carrier or railway company is permitted to make unreasonable charges, or to carry goods at a lower rate for one customer than for another. If a railway company accept goods for delivery to a place on the line of another railway company, the liability for loss or damage rests on the first company for the whole journey, and any contract with the sender in an opposite sense is void. Dangerous goods, such as gunpowder, oil of vitriol, &c., must have their nature distinctly marked on the outside, or notice of their character must be given in writing to some responsible railway servant. Railway companies cannot evade liability for loss or injury due to their fault, by any notice or declaration. If goods are wrongfully detained by a carrier after the proper charges have been tendered he renders himself liable to an action for wrongful detention; and if he make an overcharge and refuse delivery till it is paid the overcharge should be paid under protest and afterwards recovered by action for money wrongfully received. Railway companies and other carriers are in all cases responsible for the acts of their servants when these are acting in their official capacity as representing the company or other carrier. Thus, if luggage is delivered to a porter to be placed in the van it is regarded as formally handed over for carriage to the specified destination, and the company's liability in respect of it begins then. The liability of carriers by water, or of railway companies in respect of their steamboats, is practically the same as that of carriers by land. They are not responsible for loss or injury due to the act of God or the queen's enemies or perils of the sea.

CARRIER, Jean Baptiste, born in 1756, an obscure attorney at the beginning of the first French revolution, was chosen, in 1792, member of the national convention, aided in the establishment of the revolutionary tribunal, March 10, 1793, and exhibited the wildest rage for persecution. He voted for the death of Louis XVI., demanded the arrest of the Duke of Orleans, April 6, 1793, and contributed greatly to the revolution of May 31. Oct. 8, 1793, he was sent to Nantes with a commission to suppress the civil war and finally put down the Vendeans. Multitudes, informally and precipitately condemned, were executed daily; but Carrier resolved to destroy the prisoners by numbers at a time and without a trial. He first caused ninety-four priests to be conveyed to a boat with a perforated bottom, under pretence of transporting them, but in reality with a view of having them drowned by night. This artifice was repeated a number of times, and the victims were of every age and of both sexes. These wholesale murders by drowning were called *noyades*. The executioners are also said to have sometimes amused themselves by tying together a young man and woman, who were then forced into the water; and they called the murders carried out in this way *republican marriages*. It has been estimated that 15,000 individuals perished in this way. The banks of the Loire were strewed with the dead, and the water was so polluted that it was prohibited to drink it. Out of terror people refrained for a time from drawing public attention to these atrocities, but at last the truth began to become known, and Carrier was recalled. Shortly after the fall of Robespierre he was arrested and brought before the revolutionary tribunal, which condemned him to death, Dec. 16, 1794.

CARRIER-PIGEON, a variety of the common pigeon in which the homing instinct has been sufficiently developed to make the bird useful and reliable as a bearer of messages; also a fancy variety characterized by the possession of certain definite points, but not necessarily useful as a homer. The show carrier-pigeon is a large, long-necked variety, with abnormally-developed wattles about the base of the beak and round the eyes, but the true homer is of smaller size, and lacks the enormous tuberculated growth. The homer as now known is the result of long and careful selection, by which the homing instinct found in all the pigeons derived from the rock-dove (*Columba livia*) has been intensified. It has a short, strong bill, long and wide wing-feathers, a rather large head, and great muscular power. The colour is variable, blue varieties being perhaps the commonest. Red is the prevailing colour of the eye, but here, too, there is considerable variety.

The careful training and breeding of homing pigeons was for long almost confined to Belgium, and even yet, in spite of the increased attention bestowed on the subject in other countries, Belgium may be regarded as the chief homing country. Two main types of the Belgian homer have been distinguished as the Antwerp and the Liège varieties, the former being larger but less graceful in form than the latter. Hitherto British pigeon fanciers have bred mainly from the Antwerp type, but of recent years crossing with individuals of the smaller and shorter-beaked kind has become common. The Belgian pigeons are themselves the result of a complicated process of interbreeding, the height of their flight being ascribed to crossing with some form of tumbler-pigeon, though their subsequent training as long-distance fliers has completely eradicated the tumbling instinct or tendency.

The training of homing pigeons requires careful attention. In many respects their treatment is exactly like that of any other variety of the domestic pigeon, but they must also be taught the special work for which they are destined. A bird's training begins when it is about three months old. It may then be taken to a distance of about a mile from its loft in a suitable direction and liberated in order that it may fly back. After an interval of a day or two it should be carried 3 miles from home *in the same direction* and set free, and on the third occasion, a few days later still, the distance is usually increased to 6 miles. This mode of training is continued steadily during the season, the successive distances above those already mentioned being 12, 25, 50, 75, 96, 125, 155, and 200 miles. The intervals of rest must be carefully preserved, especially in times when the weather is unfavourable. During the bird's second season it is made to repeat something of its first year's performances and to extend its flight to 250 miles or possibly to a greater distance. During the following three seasons good birds will be at their best, and even for some few years later they may do good work. During the training period and also at other times the housing and feeding of the birds must be carefully attended to. The loft must be airy, dry, and scrupulously clean, and during training the food should consist mainly of peas and beans. North or south directions are preferable to others, and east winds should be avoided. Over-training should be carefully avoided, not only because it militates against success, but also because it is cruel,

Velocities of over 30 yards per second have been recorded for various pigeons, but the average velocity of an average bird is rather less than half that amount. One bird, in 1896, actually covered the distance from Thurso to London, just over 500 miles, within one day, its average velocity being about 24 yards per second. In unfavourable weather the height attained varies from about 320 to rather over 400 feet, but in good weather some birds will reach a height of about 1000 feet. Over 500 miles a day have been accomplished in favourable weather. The distance from Algiers to Paris, fully 1100 miles, is one of the longest on record as having been travelled by a pigeon.

There has been much discussion regarding the nature of the instinct by which pigeons return to their homes over such long distances. That there is a home-seeking instinct in all the varieties and descendants of the rock-pigeon is undoubted, but in some it is very faint, and even in homers it requires careful training. Untrained birds often fail to return, and during training young birds are often lost. Beyond the fact of the necessity of training, however, very little, if anything, is known of the real causes or means of home-seeking. Some regard sight as playing an important part in it, others memory, whilst still others regard the winds as important factors in the problem.

The homing instinct of the pigeon has been known from very ancient times, and there are many recorded instances of the employment of pigeon messengers by ancient peoples. The Hebrew tradition of the deluge, as we have it in our Bibles, shows some acquaintance with such a means of transmitting information, and it was known also to the Greeks and Romans. Diocletian is said to have established a regular pigeon post. Pigeons were employed for war purposes at the siege of Mutina (Modena) in 44 B.C., and later at the celebrated sieges of Haarlem (1573) and Leyden (1574). During the first half of the nineteenth century pigeons were widely used in Britain for the rapid communication of intelligence,and in particular many stockbrokers obtained early information of the state of the markets by this means. The introduction of the electric telegraph, however, soon led to the complete disuse of the pigeon post. The siege of Paris during the Franco-German war of 1870–71 first brought the carrier-pigeon into prominent notice as a valuable means of communication in time of war. During that siege more than 350 birds were sent out of the city in balloons, and of these some 300 were liberated with messages. Only some 70 returns were made, and these were effected by 57 birds. By the adoption of micro-photography the space occupied by a message was so reduced that a single pigeon could carry a very large number of messages without having its movements hampered in the least. One of the pigeons that succeeded in returning to Paris carried no less than 40,000 messages on eighteen collodion films which were inclosed in a goose-quill attached to the tail. Since that time the leading Continental powers have established elaborate pigeon systems for use in time of war, but Britain has not yet taken any steps in this direction.

The thorough organization of homing as a sport in Britain dates from about 1880, and there are many large clubs throughout the country, among the largest being the Manchester and the Central Counties Flying Clubs. In 1896 the National Homing Union was founded, and the number of clubs affiliated to it is now over 100. A similar German body, founded in 1894, the Verband Deutscher Brieftaubenliebhabervereine, with the emperor at its head, includes more than 400 unions, mostly in the western parts of the country. Belgium has about 2000 Sociétés Colombophiles, some of them having important races. France, Italy, Denmark, and other countries of Europe also have important homing clubs which receive a certain amount of official recognition from their respective governments.

CARRION CROW, a name of the common crow (*Corvus corone*), so called because it often feeds on carrion (see CROW); also of an American black vulture (*Catharista atrata*). See VULTURE.

CARRION FLOWERS, a name given to the species of the genus Stapelia, of the order Asclepiadaceæ, on account of their putrid odour, and also to the liliaceous plant *Smilax herbacea*. See STAPELIA.

CARRON, a village of Scotland, on the banks of a stream of the same name, in Stirlingshire, 2 miles from Falkirk, celebrated for its extensive iron-works, begun in 1760. This establishment now employs about 2500 hands, the company possessing and working mines of iron ore, coal, and limestone. Besides Carron village, there are other villages more or less depending on the Carron Company's works, as Carronshore, Stenhousemuir, &c. Pop. of Carron village 1208, of Carronshore 1076. The river of same name is a small stream, rising in an extensive meadow called the Carron Bog, near the centre of the county, and after an E. course of about 17 miles, falling into the Forth at Grangemouth. In its course it supplies water to paper-mills, factories, &c.

On a small eminence immediately adjoining the iron-works, at their north-west corner, stood till 1743 what was called Arthur's Oo'n or Oven, a somewhat beehive-shaped building, supposed to have been a Roman sacellum or sanctuary, which was pulled down by its owner, whom the antiquaries will never forgive, to make a mill-dam. A ground-plan and elevation of it are given by General Roy in the thirty-sixth plate of his Military Antiquities.

CARRONADE, an iron gun introduced in 1779 by the director of the Carron Foundry, from which it took its name, said to have been invented in 1752 by General Melville,and first used in the American revolutionary war. They were of large calibre, and lighter than common cannon; but they admitted of only a small charge of powder, and had a very confined range.

CARROT (*Daucus Carota*, Linnæus) is a biennial umbelliferous plant, a native of Britain. The leaves are tripinnate, leaflets ovate, cut. The plant rises to the height of 2 feet, and produces white flowers, succeeded by rough hispid seeds. The root of the plant, in its wild state, is small, dry, tapering, of a white colour, and strong-flavoured; but the root of the cultivated variety is large, succulent, and of a red-yellow or pale straw colour, and shows remarkably the improvement which may be effected by cultivation. Though long known as a garden plant it is comparatively of recent introduction in agriculture. It appears to have been cultivated from an early period in Germany and Flanders, and introduced from the latter country to Kent and Suffolk early in the sixteenth century. The various uses of the carrot in cookery are well known. But although it contains much nutriment it is difficult of digestion, particularly if eaten raw or imperfectly boiled. Carrots are an excellent fodder for cattle and horses, either alone or mixed with hay; and if given to cows in winter or the early part of spring, they are said to cause a great increase of milk, which will have a much less offensive taste and smell than when they are fed on turnips. Hogs thrive well upon carrots boiled with their wash. In some parts of England this vegetable has been cultivated as a winter food for deer; and the tops have even been made into hay. Carrots contain a large proportion of saccharine matter, and various but unsuccessful experiments have been made to extract sugar from them. They have been more advantageously employed in distillation: 10 lbs. weight of carrots will yield about half a pint of very strong ardent spirit; and the carrots produced by an acre of ground, amounting to 20 tons, have been known to yield 240 gallons of spirit. A sirup made of these roots, and clarified with the whites of eggs, has been found useful for several purposes. An infusion of the seeds, and the expressed juice of the roots, are said to afford relief in fits of the gravel. A marmalade of carrots has been used with success in sea-scurvy, and a poultice prepared from them is sometimes employed in cancerous ulcers. Crickets are so fond of these roots, that they may be easily destroyed by making a paste of flour, powdered arsenic, and scraped carrots, and placing this near their habitation. Parkinson informs us that, in his day, ladies wore carrot leaves in the place of feathers. In winter a kind of ornament is sometimes formed by cutting off a section from the head or thick end of a carrot, containing the bud, and placing it in a shallow vessel with water. Young and delicate leaves unfold themselves, forming a radiated tuft of a very handsome appearance, heightened by contrast with the season of the year.

CARRYING-TRADE, a phrase used in political economy, and also in commercial transactions. It usually refers to the commerce of different countries with each other, and is most frequently applied to carriage by sea. In a purely commercial sense the carrying-trade is simply the carriage of commodities from one place or country to another, irrespective of the mode of conveyance. In political economy the term is used in a special and restricted sense. In considering the entire commerce of a country it may be found that a part of that commerce is not directly with any one foreign country, but consists in supplying facilities for the conveyance of goods from one foreign country to another. The ships of England or of Holland, for example, may be employed in carrying goods between India and China. This is called a carrying-trade. The carrying-trade does not consist merely in the occasional charter of vessels to foreign merchants for a foreign voyage. Though this may be included in it, its regular organization implies more than this. A shipowner, instead of lending his vessels incidentally to foreign merchants, may build or purchase them expressly for the purpose of conveying goods between different foreign ports at his own risk, and may even invest capital in merchandise to be so conveyed. It is to this abnormal development of commerce that the term carrying-trade in its restricted sense is applied. It is an investment of capital common in the case of commercial communities which have acquired great surplus wealth, or from the limited range of their territory have few home investments. From the earliest times the principal commercial communities, especially the great trading cities of antiquity, and those of the middle ages which have formed communities in themselves, have embarked largely in this kind of commerce. Its value as an investment, and its proper place in the scale of commercial development, are satisfactorily discussed in Adam Smith's Wealth of Nations.

CARSE, a word of uncertain origin, applied in Scotland to low and fertile land in the neighbourhood of rivers. The term is sometimes used to denote the whole of a valley watered by a river as distinguished from the higher grounds, as the Carse of Stirling or the Carse of Gowrie.

CARSTAIRS, William, a Scottish divine of political eminence, was born in 1649, at Cathcart, near Glasgow, where his father was minister. He pursued his studies at the University of Edinburgh, whence he was removed to that of Utrecht, was introduced to the Prince of Orange, and intrusted with all his views in regard to Britain. He, however, returned to Scotland, with the view of entering the ministry, but after receiving a license to preach, resolved to return to Holland. As he was to pass through London, he was employed by Argyle and his party to treat with the English exclusionists, and became privy to the Rye-house plot. On the discovery of that conspiracy he was apprehended. After a rigorous confinement in irons he was subjected to the torture, and endured this trial with great firmness; but being afterwards deluded with the hopes of a full pardon, and assured that his answers should never be made evidence against any one, he submitted to make a judicial declaration. The privy-council violated their engagement by producing his evidence in court against his friend Mr. Baillie, of Jerviswood. Being released he returned to Holland, and was received by the Prince of Orange as a sufferer in his cause. The prince made him one of his own chaplains, and procured his election to the office of minister of the English congregation at Leyden. He accompanied the prince in his expedition, and always remained about his person, both at home and abroad. During this reign he was the chief agent between the Church of Scotland and the court, and was very instrumental in the establishment of Presbyterianism, to which William was averse. On the death of William he was no longer employed on public business; but Anne retained him as her chaplain-royal, and made him principal of the University of Edinburgh. When the union of the two kingdoms was agitated he took a decided part in its favour. He did not long survive this event, dying in 1715 at the age of sixty-six. The memory of Carstairs is for the most part revered by his countrymen as that of an enlightened patriot; and few men of active power and influence have steered between parties more ably and beneficially.

CARSTENS, Asmus Jacob, a Danish painter, born at St. Jurgen, near Schleswig, in 1754; died at Rome in 1798. His works are nearly all taken from classical subjects, and are distinguished by correctness of form and outline, gracefulness of attitude, and loftiness and vigour of expression; but they frequently exhibit a certain harshness, arising from too close imitation. He was often defective in anatomy and perspective, and having begun late to paint in oil, was unacquainted with the secrets of colouring. A piece containing more than 200 figures, The Fall of the Angels, is one of his most celebrated works.

CART, two streams, Scotland, county Renfrew.—1. The White Cart rises in Carrot Moss, s.w. Eagles-ham, flows N.W., and, passing Cathcart and Pollokshaws, receives the Levern near Crookston Castle, passes through Paisley, and falls into the Clyde a short distance below Renfrew, after a course of 20 miles. A part of its course serves as the boundary between the counties of Renfrew and Lanark.—2. The Black Cart, a smaller stream, 9 miles long, issues from Castle Semple Loch, 5½ miles S.W. Paisley, flows N.E. past Johnstone, and after receiving the Gryfe, which doubles its volume, falls into the White Cart about a mile above its influx into the Clyde.

CART, a carriage with two wheels, fitted to be drawn by one horse or other animal, and used in husbandry or commerce for carrying many sorts of goods. In Scotland the cart is commonly used for purposes similar to those for which the wagon is used in England. There are various descriptions of carts used in agriculture, and for many kinds of agricultural work the cart is preferable to the wagon. The ordinary cart for heavy goods has no springs, but there are many carts provided with springs, one type being commonly known as the *Whitechapel cart.* All carts in Great Britain must have the name and address of the owner painted conspicuously on them.

CARTAGENA, or CARTHAGENA (ancient *Carthago Nova*), a city and fortified seaport and naval arsenal of Spain, in the province of and 31 miles S.S.E. Murcia, to which there is a railway. Its harbour, one of the largest and safest in the Mediterranean, has depth of water for the largest vessels, is sheltered from all winds by lofty hills, and guarded from the sea by the island of Escombrera. The town, situate at the N. end of the harbour, is surrounded by a lofty wall, flanked with bastions. The principal streets are spacious and regular, and many of the houses, though of simple architecture, well built, and provided with balconies. The principal edifices are the cathedral, dating from the thirteenth century, now converted into a simple parish church; the old castle, supposed to date from the foundation of the city by the Carthaginians; the barracks, arsenal, presidio or convict establishment, the military hospital, the Hospital de Caridad, the artillery park, the observatory, the convents of St. Augustine and Monjas, and several other convents and churches. Great improvements have been made recently in the accommodation for shipping by the construction of moles, wharves, breakwaters, and a floating-dock. Lead smelting is largely carried on; and there are also in the neighbourhood rich mines of excellent iron, which are connected with the harbour by means of a tramway about 8 miles in length. Esparto grass, compressed by hydraulic power, is largely shipped; other exports are iron ore, lead and lead ore, copper ore, zinc ore, fruits, &c.; coke and coal are imported from Great Britain to the extent of over 70,000 tons annually. From time to time Cartagena has suffered greatly by its unhealthiness, but drainage operations have improved its sanitary conditions. Cartagena was founded by the Carthaginians under Hasdrubal about 228 B.C. It was taken by Scipio Africanus, B.C. 210. It afterwards became a Roman colony. In A.D. 425 the Vandals largely destroyed it; and in 711, after having been in the possession of the Visigoths, it was again destroyed by the Saracens. When Spain possessed her colonies, and was in a flourishing condition, Cartagena was one of her most important naval stations, and carried on a very extensive commerce. In 1873 a body of communists obtained possession of the town and fortifications, but they were compelled to surrender in the following year. Pop. (1897), 86,245.

CARTAGENA (S. Amer.). See CARTHAGENA.

CARTAGO.—1. A town of Central America, formerly capital of Costa Rica, on the right bank of a river of its own name, 14 miles E.S.E. San José. It was formerly a place of considerable commercial importance, and had a pop. of about 37,000. It was so utterly ruined by an earthquake on September 2, 1841, that only one church and 100 houses were left standing. It had already been superseded both as a capital and a seat of commerce by San José. The railway from San José to Limon passes through it. Near the town are the springs of Aguacaliente, and also Mount Cartago or Irazu, an active volcano, rising 11,480 feet above the sea-level. Pop. (1892), 3491. —2. A town of Colombia, in the state of Cauca, in the valley of the Cauca, on the Viega, a tributary of that river. Its trade is principally in dried beef, pigs, fruits, coffee, cacao, and tobacco. The sugar-cane thrives well here. Cartago is the entrepôt for the trade of Santa-Fe-de-Bogotà. The climate is hot, but dry and healthy. Pop. 8000.

CARTE, THOMAS, an English historian, was born at Clifton-upon-Dunsmoor, Warwickshire, in 1686. He was admitted at University College, Oxford, in 1698, and afterwards studied at Cambridge, where he took his degree of M.A. in 1706. His first publication was entitled the Irish Massacre set in a Clear Light, &c., a pamphlet in which he defended Charles I. from the common charge of secretly instigating the rebellion and massacre in Ireland in 1641. Incurring suspicions during the rebellion of 1715, a warrant was issued for his apprehension, which he eluded by concealment. He subsequently seems to have acted as secretary to Bishop Atterbury; and, as it was supposed that he was concerned in the conspiracy imputed to that prelate, a reward of £1000 was offered for his apprehension. He again made his escape, and went to France. Obtaining free access to the principal libraries, he collected material for an English edition of the History of Thuanus (de Thou). At length Queen Caroline procured leave for his return to England. His important work, the Life of James Duke of Ormonde, was published in three vols. folio, 1735-36. This work gained him great reputation, especially with the Tory party, and led him to meditate a general history of England. In 1744 he was arrested during the suspension of the Habeas Corpus Act, and examined on a suspicion of being employed by the Pretender. Nothing, however, appearing against him, he was discharged. The first volume of his history of England, in folio, published in 1747, might have been very well received had not he inserted a note containing the ridiculous story of the cure of one Christopher Lovel, who went from Somersetshire to Avignon to be touched for the king's evil by the Pretender. Notwithstanding the withdrawal of promised support he proceeded with his work, and published two more volumes in 1750 and 1752; the fourth, which brought down the history to 1654, not appearing until after his death. The character of this work is deservedly high for useful and elaborate research. Hume and other historians have been indebted to it, but the prejudices of the author, who is utterly destitute of the philosophical impartiality requisite for an historian, are everywhere conspicuous. Carte died on April 2, 1754.

CARTE DE VISITE, literally a visiting card, a photographic likeness executed on a card somewhat larger than a visiting card, and usually inserted in a photographic album. Cartes de visite were introduced by Disdéri in 1854.

CARTEL, an agreement for the delivery of prisoners or deserters; also, a written challenge to a duel.—*Cartel-ship*, a ship commissioned in time of war to exchange prisoners; also to carry any proposal between hostile powers. She must carry no cargo, ammunition, or implements of war, except a single gun for signals.

CARTER, ELIZABETH, an English lady of great learning, the daughter of Dr. Nicholas Carter, a clergyman in Kent, was born in 1717. She was educated by her father, and soon became mistress of Latin, Greek, French, and German; to which she afterwards added Italian, Spanish, Portuguese, Hebrew, and Arabic. Several of her poetical attempts appeared in the Gentleman's Magazine before she attained her seventeenth year, and these procured her much celebrity. In 1739 she translated the critique of Crousaz on Pope's Essay on Man; and in the same year gave a translation of Algarotti's explanation of Newton's Philosophy for ladies. In 1749 she commenced a translation of Epictetus, which was published in 1758. She died in 1806, in the eighty-ninth year of her age.

CARTESIAN IMPS (*Diaboli Cartesiani*), the name given to a kind of little glass figures, which have a small opening at the top, and are rather lighter than an equal column of water, so as to be able to float. The figures are placed in a bottle of water having a narrow neck, closed with a piece of bladder. On pressing the bladder with the finger the floating figure sinks down, and from the introduction of a small quantity of water becomes specifically heavier. By removing the pressure the water is expelled, and the figure, thus lightened, again rises to the surface. Also called *Cartesian Devils* or *Divers.*

CARTESIAN PHILOSOPHY. See DESCARTES.

CARTHAGE (the Phœnician *Kereth-hadeshoth*, new city, is conjectured to have been the native name from which the Greek *Karchēdon*, and the Roman *Carthago* are derived), the most famous city of Africa in antiquity, capital of a rich and powerful commercial republic. According to tradition, Dido, fleeing from Tyre, came to this country, where the inhabitants agreed to give her as much land as could be compassed by an ox-hide. Dido cut the hide into small thongs, with which she inclosed a large piece of land. Carthage was founded, according to Aristotle, 287 years later than Utica. Becker supposes it to have been a joint colony or *factory*, in the Anglo-Indian sense, of Tyre and Utica. The actual date of its foundation is much contested. The uncertainty is accounted for probably by the gradual growth of the city, as well as by the diversity of epochs reckoned from, and the different calendars, or modes of computing time, used by the different chroniclers. The date usually given is 878 B.C. The history of Carthage is usually divided into three periods. The first is the epoch of its gradual rise; the second that of the struggles with other states occasioned by its extended power; the third that of its decline and fall. These epochs interlock each other, and it is only as a matter of convenience that we can interpose exact dividing dates between them. The first epoch has been extended as far as to 410 B.C.; the second limited to the period chiefly distinguished by wars with Greece, 401–265; the third is the period occupied with the Roman wars, and ending with the fall of Carthage.

Carthage appears early to have been independent of Tyre, if ever she owned any direct dependence on the mother-city. There existed, however, a close relationship between them, due to affinity of race and religion. This appears from various incidents in their history, as when the Tyrians refused to follow Cambyses in a contemplated attack on Carthage, and when Alexander, having attacked Tyre, the women and children were sent to Carthage. Tyre also appears as an ally of Carthage in her second treaty with Rome; and an annual offering was sent from Carthage to Tyre for the Temple of Hercules, to the neglect of which in periods of prosperity, subsequent calamities were often attributed.

Of the early rise of Carthage little is known. The tradition has already been mentioned which ascribes the original possession of her site to a peaceable purchase from the Libyans. There is no evidence, however, that her government was ever monarchical. She appears soon to have acquired an ascendency over the earlier Tyrian colonies Utica, Tunis, Hippo, Leptis, and Hadrumetum. This was probably acquired without any effort, as the result of her material prosperity. Placed amid foreign, and often hostile tribes, the African colonies of Tyre might have slight jealousies and rivalries among themselves; but their relations must, on the whole, have been friendly and confidential, and in the earlier stages of their history at least they would naturally follow the lead of the strongest among them. The rise of Carthage, then, may be attributed to the superiority of her site for commercial purposes, and the enterprise of her inhabitants. Her relations with the native populations, as is evident from her subsequent history, would always be those of a superior with inferior races. Some of them were directly subject to Carthage, others contributed to her strength by recruiting her armies, although frequently in hostility with her. Carthage in her rise presents, in fact, a close analogy with the East Indian colonies of Great Britain. She established colonies for commercial purposes along the whole northern coast of Africa, w. of Cyrenaica, and these colonies enabled her to maintain and extend her influence over the native tribes. These colonies, together with most of the earlier Phœnician colonies subject to her, possessed little strength in themselves, and easily fell a prey to an invader; hence they were in the end a source of weakness, although it is not easy to see how her prosperity could have been attained without them. It is only after the N. of Africa had thus been placed at her command that Carthage appears formally on the stage of history. One of her earliest recorded contests is that with Cyrene, when the boundary between the two states was fixed to the advantage of Carthage, at the bottom of the Greater Syrtis, the Carthaginian envoys, according to the traditional story, consenting to be buried on the spot The immediate wants of the city were provided for by the cultivation of the surrounding territory, which alone was directly dependent on her.

Commerce naturally led Carthage to conquest. The advantages, both for the promotion and protection of her trade, of possessing islands in the Mediterranean, led to her first enterprises. Expeditions to Sicily and Sardinia appear to have been undertaken before the middle of the sixth century. The war was carried on in the latter half of this century by Mago, and his sons Hasdrubal and Hamilcar. At the same time a war arose with the Africans on account of the refusal of the Carthaginians to continue the payment of a ground-rent for their city. In this the Carthaginians were unsuccessful, but at a subsequent period they achieved their object. Sardinia was their first conquest. They guarded it with the utmost jealousy. The Romans, by the first treaty (B.C. 509), were allowed to touch at it; but this permission was withdrawn in the second. It was the entrepôt of their trade with Europe, and lessened their dependence on their own territory for corn. They founded its capital, Caralis, now Cagliari. They soon after occupied Corsica, where they united with the Tyrrhenians, its previous possessors, against the Greeks. Sicily was already occupied by Greek and Phœnician colonies. The latter, on the decline of Tyre, seem to have fallen under the dominion of Carthage, which gave her a footing on the island. The Greeks were still the more powerful party, and the Carthaginians occupied themselves in promoting dissensions among their cities. When the Greeks were occupied with the Persian invasion, they organized a great expedition to take possession of the island, in which they landed 300,000 men, contributed by all their dependencies. Among these Sardinians, Corsicans, and Ligurians, the latter from the Gulfs of Lyons and Genoa, are enumerated. They were totally defeated by Gelon, tyrant of Syracuse, and their leader slain, in the battle of Himera, B.C. 480. The Balearic, and many smaller islands in the Mediterranean, had already been occupied by the Carthaginians. Spain had also been colonized by them with peaceable commercial settlements. No other great enterprise took place in the first period of her history.

The war with the Greeks in Sicily was renewed in 409. Hannibal, the son of Gisco, landed an army at Lilybæum, in the spring of that year, and reduced Selinus and Himera. In a subsequent expedition Agrigentum was subdued. A pestilence seconded the efforts of Dionysius and saved Syracuse, B.C. 396. A treaty put an end to the war in 392. The struggle between the Greeks and the Carthaginians continued with varying success throughout the remainder of this period. Its most remarkable event was the invasion of Africa by Agathocles, B.C. 310. Defeated in Sicily by the Carthaginians, to avert the total ruin of his affairs, he raised an army and passed over to Africa. The most extraordinary success awaited him, showing at once the weakness of the hold which Carthage had of her external possessions on the continent, and the danger she constantly encountered from factions and dissensions within the city itself. Agathocles was the precursor of Scipio. After the death of Agathocles the Carthaginians renewed their enterprise in Sicily, and had nearly completed its conquest when the Greeks called in the aid of Pyrrhus, who for a time arrested their progress (B.C. 277–5). Notwithstanding numerous and disastrous defeats in their contests with the Greeks, the Carthaginians seemed, after the departure of Pyrrhus, to have the conquest of Sicily at length within their power. A dissension with the Mamertines, their former allies, called in the Romans, and with their invasion, B.C. 264, the third period of Carthaginian history begins.

Of the struggle which constituted the great event of this period fuller details will be found under the articles ROME and HANNIBAL. We here briefly summarize. The first Punic war, in which Rome and Carthage contended for the dominion of Sicily, was prolonged for twenty-three years, B.C. 264 to 241, and ended, through the exhaustion of the resources of Carthage, in her expulsion from the island. The second Punic war, conducted on the side of the Carthaginians by the genius of Hannibal, lasted seventeen years, B.C. 218 to 201, and after just missing the overthrow of Rome, ended in the complete humiliation of Carthage. The policy of Rome, at the end of this war, in placing Carthage, disarmed, at the mercy of her African enemies, and raising her a powerful opponent in Masinissa, occasioned the third Punic war, in which Rome was the aggressor. It lasted only three years, but served to throw a halo of glory round the fall of the republic, in whose total ruin it ended. This war, begun B.C. 150, was ended B.C. 146, in the destruction of Carthage.

In this sketch many important events in the history of Carthage have been necessarily passed over. Her repeated and not always unsuccessful struggles with her African neighbours, in the very midst of her schemes of foreign conquest, indicate the marvellous tension to which a power, inherently so weak, was wrought in those great enterprises which virtually grasped at the supremacy of the world. In this matter the experience of Carthage was not unparalleled by that of Rome; but the great difference between them was that the former was surrounded by alien tribes, the latter by races kindred in language and manners, with whom, after conquest, she could easily unite. The invasion and conquest of Spain, begun by Hamilcar and carried on by Hasdrubal and Hannibal, and which led to the second Punic war, can only be mentioned in passing.

Carthage having perished, has left no historians to tell her tale; hence many interesting circumstances in her history can never be known, and what is preserved has the colour of partial, and often hostile authority. The constitution of Carthage has occupied much of the attention of scholars, but still remains in many points obscure. The name of king occurs in the Greek accounts of it, and the first Carthaginian general who is recorded to have invaded Sicily and Sardinia is called Malchus, the Phœnician for king, but the monarchical constitution, as commonly understood, never appears to have existed in it. The officers called kings by the Greeks were two in number, the heads of an oligarchical republic, commonly called Suffetes, the original name being considered identical with the Hebrew *Shofetim*, judges. These officers were always chosen from the principal families, and were elected annually. It is not known if they could be re-elected. There was a senate of 300, and the citizens were divided into classes similar to the Roman tribes, curiæ, and gentes. There was a smaller body of thirty chosen from the senate, sometimes another smaller council of ten. Various other officers are mentioned, but the particulars regarding them are often obscure, and sometimes contradictory. There seems to have been an appeal to the people in certain circumstances, but the power at first lay almost exclusively in the hands of the oligarchy. The constitution worked well during the early part of the history of Carthage, but in its later ages the state was divided by bitter factions, and liable to violent popular tumults. Both Hamilcar and Hannibal, in their most important enterprises, experienced the opposition of the aristocratic party, led by Hanno, the head of a rival family, who appears to have been for a long period a consistent advocate of alliance with Rome.

After the destruction of Carthage, her territory became the Roman province of Africa. A curse was pronounced upon the site of the city, and any attempt to rebuild it prohibited. The attempt was, however, made twenty-four years after her fall, by Caius Gracchus, one of the most distinguished men of Rome. The same plan was entertained by Julius Cæsar, and it was accomplished by Augustus. The new city became the seat of the proconsul of Old Africa in place of Utica, and continued to flourish till the Vandal invasion. It became distinguished in the annals of the Christian church. Cyprian was its bishop, and Tertullian is supposed to have been a native of it. It was taken and destroyed by the Arabs, under Hassan, in 647.

The religion of the ancient Carthaginians was that of their Phœnician ancestors. Their sending offerings to Tyre has been noticed; and it may be observed that there is some basis of truth in every superstition. The claims of kindred and of patriotism were recognized in this tribute, and these natural feelings were outraged, and the consciences of the Carthaginians offended when it was omitted. Yet the religion of Carthage was a very dark superstition. They worshipped Moloch or Baal, to whom they offered human sacrifices; Hercules, the patron deity of Tyre and her colonies; Astarte, and other deities, which were identified with the heavenly bodies, but propitiated by cruel or lascivious rites. Their religion was considerably modified by their intercourse with the Greeks. After their defeat by Gelon he made it a condition of peace with them that they should abandon human sacrifices. Some of their deities were identified with those of the Greeks, and they adopted others of that people, and no doubt received also some of their ideas regarding them. See Arnold's or Mommsen's History of Rome; Bosworth Smith's Carthage and the Carthaginians; Prof. Church's Carthage.

CARTHAGENA (in Spain). See CARTAGENA.

CARTHAGENA, a city and seaport, capital of the department Bolivar, in the Republic of Colombia, It is surrounded with massive walls, and otherwise fortified, but its fortifications are of little strength. The town and suburbs are well laid out, and the houses are of stone, with balconies and lattices of wood. There are a cathedral, government buildings, college, theatre, a statue of Bolivar, &c. Fever is apt to prevail, but more attention has lately been paid to sanitation. The exports consist of cattle, tobacco, coffee, hides, ivory-nuts, timber, rubber, &c., the imports being chiefly manufactured goods. Its trade is partly carried on by the river Magdalena, with which it is connected by railway and canal. Carthagena was founded by the Spaniards in 1533. It was burned by Drake in 1585. Pop. 9681.

CARTHUSIANS, a religious order instituted by St. Bruno, who, about 1084, with six companions built an oratory and several cells or hermitages in a desert region in a high valley of the Alps, not far from Grenoble, and united the ascetic with the monastic life. (See BRUNO.) The discipline to which the monks subjected themselves was very severe: their dress was of the coarsest materials and as scanty as possible, and a hair shirt was worn next the skin; four days in the week their food consisted of bread and water alone, the bread being made of bran; flesh they were not allowed to taste, and fish only when given in alms; eggs and cheese were allowed as dainties on Sundays and Thursdays, and the brothers had regularly only one meal a day. Their time was occupied in praying, reading, and manual labour, including the transcribing of manuscripts. At first they had no written code of statutes, and a complete and final code was not compiled till 1581, to which Pope Innocent XI. gave his approval in 1688. The order gradually acquired a great many houses, some of them very extensive and wealthy establishments. The number belonging to it at the beginning of the eighteenth century was about 170. Each house or monastery bore the name of Chartreuse (the Italian form of this is *Certosa*, as in the Certosa di Pavia—see PAVIA), the parent establishment being the Grande Chartreuse. There were nine houses in England at the dissolution of the monasteries, the most famous being the one in London whose name (in a corrupted form) is still familiar as the Charterhouse (which see). A monastery of the order has in recent times been established near Steyning in Sussex. The Grande Chartreuse is situated about 13 miles N.N.E. of Grenoble, department of Isère (France). The monks depend partly upon the offerings of visitors, but also earn a considerable revenue by the preparation of the excellent liqueur known as *Chartreuse*, which, however, is not made in the monastery itself, but at Fourvoirie in the neighbourhood. Its actual composition and method of preparation are kept secret, but fine spirit and various aromatic herbs are what give it its character. The distinguishing dress of the order is white, but when away from their monastery the monks wear a long black cloak and hood. The discipline of the order is still as in its early days. The monks still live each in his own cell, the cells being contiguous but each independent, and having a separate plot of garden. The community has a common church and cemetery, and the monks of course meet together for religious exercises.

CARTILAGE is a well-known substance, entering into the composition of several parts of the body. When cut, the surface is uniform, and contains no visible cells, cavities, nor pores, but resembles the section of a piece of glue. It possesses a very high degree of elasticity, and hence it enters into the composition of parts whose functions require the combination of firmness with pliancy and flexibility, the preservation of a certain external form, with the power of yielding to external force or pressure. Anatomists divide cartilages into two kinds, the *temporary* and the *permanent*. The former are confined to the earlier stages of existence; the latter commonly retain their cartilaginous structure throughout life. The *temporary cartilages* are those in which the bones are formed. All the bones are formed in a *nidus* of cartilage. The *permanent cartilages* are of various kinds. They compose the external ear and external aperture of the nostrils and eyelids. The larynx is formed entirely of this substance, and the trachea or windpipe, with its branches, is furnished with cartilaginous hoops, by which these tubes are kept permanently open for the ready passage of air to and from the lungs. The bodies of the vertebræ are joined by large masses of a peculiar substance, partaking of the properties and appearance of cartilage and ligament, which allow of the motions of these parts on each other, without weakening the support that is afforded to the upper parts of the body in general, and to the head in particular, by the vertebral column. These cartilages impart great elasticity to the spine, by which the effects of concussion from jumping, from falls, &c., are weakened and destroyed before they can be propagated to the head. When the body has been long in an erect position the compression of these cartilages by the superior parts diminishes the height of the person. They recover their former length when freed from this pressure. Hence a person is taller when he rises in the morning than after sustaining the fatigues of the day, and the difference has sometimes amounted to an inch. Cartilages are sometimes interposed between the articular surfaces of bones, where they fill up irregularities that might otherwise impede the motions of the part, and increase the security of the joint by adapting the articular surfaces to each other. These surfaces are in every instance covered by a thin crust of cartilage, having its surface most exquisitely polished, by which all friction in the motions of the joint is avoided.

CARTOON has various significations. In painting, it denotes a sketch on thick paper, pasteboard, or other material, which is used as a model for a large picture, especially in fresco, oil, tapestry, and sometimes in glass and mosaic. In fresco painting, cartoons are particularly useful, because in this a quick process is necessary, and a fault cannot easily be corrected. In applying cartoons, the artist commonly traces them through, covering the back of the design with black-lead or red chalk; then, laying the picture on the wall or other matter, he passes lightly over each stroke of the design with a point, which leaves an impression of the colour on the plate or wall; or the outlines of the figures are pricked with a needle and then, the cartoon being placed against the wall, a bag of coal-dust is drawn over the holes, in order to transfer the outlines to the wall. In fresco painting, the figures were formerly cut out and fixed firmly on the moist plaster. The painter then traced their contour with a pencil of wood or iron, so that the outlines of the figures appeared on the fresh plaster, with a slight but distinct impression, when the cartoon was taken away. In the manufacture of a certain kind of tapestry the figures are still cut out, and laid behind or under the woof, by which the artist directs his operations. In this case the cartoons must be coloured.

The most famous cartoons in existence are those executed by Raphael for the celebrated tapestries of the Vatican, which were made at Arras, and hence called Arazzi. Two sets of these tapestries were ordered by Leo X., one for the Vatican and the other for presentation to King Henry VIII. The second set, or fragments of it, are still in existence on the Continent. The cartoons lay for a time neglected at Arras, and have repeatedly fallen into neglect again, so that out of twenty-five, the original number, only seven remain, and these have had to be restored. They were purchased at the advice of Rubens by Charles I. about 1630. On the sale of his effects they were purchased by the order of Cromwell for the nation, but again fell into neglect in the time of Charles II. William III. had them restored, and built a gallery for them at Hampton Court, where they remained, until in 1865 they were lent to the South Kensington Museum. The subjects of the seven are: 1, Paul Preaching at Athens; 2, The Death of Ananias; 3, Elymas the Sorcerer Struck with Blindness; 4, Christ's Charge to Peter; 5, The Sacrifice at Lystra; 6, Peter and John Healing the Cripple at the Beautiful Gate of the Temple; 7, The Miraculous Draught of Fishes. The cartoons have been repeatedly engraved, among others by Dorigny, Holloway, and Gribelin. They have also been extensively made known by photographs.

The cartoon of the School of Athens, carried to Paris by the French, and a fragment of the Battle of Maxentius and Constantine, are preserved in the Ambrosian Gallery at Milan. There are, likewise, cartoons by Giulio Romano in the Sala Borgia, by Domenichino and other Italian masters, who caused their pictures to be executed, in a great degree, by their scholars, after these cartoons. The value set upon cartoons by the old Italian masters may be seen by Giov. B. Armenini's Precetti dello Pittura (Venice, 1687, 4to). In later times large paintings, particularly in fresco, were not executed so frequently. The artists also laboured with less care, and formed their great works more from small sketches. In modern times some German artists have prepared accurate cartoons. Among them is Cornelius, whose cartoons for his fresco paintings in Munich have acquired much celebrity. He prepared, too, a cartoon for the fresco picture representing Joseph Interpreting the Dream. Overbeck and Julius Schnorr may also be mentioned for their cartoons.

CARTOUCH (French *cartouche*), in architecture, sculpture, &c., denotes an ornament representing a scroll of paper, being usually in the form of a table, or flat member, with wavings, whereon is some inscription or device.—In heraldry, a name given to a sort of oval shield, much used by the popes and secular princes in Italy, and others, both clergy and laity, for painting or engraving their arms on.

CARTOUCHE, a wooden case about 3 inches thick at bottom, and girt round with marline, holding 200, 300, or 400 musket balls, with eight or ten iron balls weighing one pound each, to be fired from a mortar, gun, or howitzer for the defence of a pass, retrenchment, &c. Such missiles have been superseded. In French military language cartouche signifies the entire charge of a fire-arm.—*Cartouche* is likewise the name given by the French literati to that oval ring or border which includes, in the Egyptian hieroglyphics, the names of persons of high distinction, as M. Champollion has proved. This border was thought at first by Zoega to include every proper name.

CARTOUCHE, Louis Dominique, a French robber, who was broken alive on the wheel in 1721. His life has formed the subject of a modern French drama, and was formerly represented on the English stage.

CARTRIDGE, a case of paper, metal, or other substance, of such size as to fit the bore of firearms, and containing gunpowder, and often also a bullet or shot. Cartridges containing a bullet are called *ball*-cartridges, *blank*-cartridges are those used without ball. Cartridges used for rifles contain the powder and bullet in a case of thin brass or copper, and have the percussion-cap by which they are ignited fixed in the base. Those for large guns are usually made of woollen cloth, and contain gunpowder only.

CARTWRIGHT, Edmund, born 24th April, 1743, at Marnham, county Nottingham, was descended from a family which had suffered from its attachment to the Stuarts. He was educated at Wakefield, and University College, Oxford, and was afterwards chosen a fellow of Magdalen College. Having taken orders in the church, he obtained first the living of Brampton, near Chesterfield, and afterwards that of Goadby-Marwood, in Leicestershire. He acquired a literary reputation after publishing some poems anonymously, by a legendary poem called Arminia and Elvira, published in 1770 in his own name; and became a contributor to the Monthly Review. It was, however, only after he had reached forty years of age that his attention was first turned to the subject on which his claim to remembrance is founded. In the summer of 1784, during a visit to Matlock, he met several Manchester gentlemen, and the conversation happened to turn to the subject of mechanical weaving. Cartwright was greatly interested, and began immediately to investigate the subject for himself, and experiment on the means of accomplishing the improvement which had been suggested. His efforts were not long of being crowned with success, and in April of the following year he brought his first power-loom into action. It was not, in fact, in respect of economy of labour, any advance upon the ordinary hand-loom; but the idea which subsequent improvements have carried so far in advance of hand-loom weaving was there. The introduction of Cartwright's loom was opposed both by manufacturers and workmen; and the first mill erected for them, containing 500 looms, was burned down. It, however, made its way, as all real improvements do; and in its developed form is now in universal use. His attention once turned in the direction of mechanical improvement, he continued to make progress in discovery. He not only perfected his power-loom, but took out ten patents for different inventions, among which was one for combing wool. He expended much of his means in these investigations, and in 1809 he received as an acknowledgment of their value a grant from Parliament of £10,000, which relieved him from straitened circumstances, although, it is said, it did not cover his expenditure. He also received premiums for various improvements from the Society of Arts and the board of agriculture. He died in 1823.

CARTWRIGHT, John, brother of the preceding, celebrated for his exertions in the cause of political reform, was born in 1740 at Marnham, Nottinghamshire, of an ancient family. His early education was rather deficient, but he made some progress in mechanics and practical mathematics. He entered the navy in 1758, and became a first lieutenant in 1766. In 1774 his attention was turned to politics. In his Letters on American Independence (Independence of America considered as supremely useful and glorious to Great Britain), written in this year, he advocated a union between the colonies and the mother state, under separate legislatures, and argued this great question on the foundation of natural, inherent right;

maintaining 'that the liberty of man is not derived from charters, but from God, and that it is original in every one.' In 1775 he was appointed major of the Nottinghamshire militia, and after several ineffectual attempts on the part of government to remove him from that post, his dismission was finally accomplished in 1792, in consequence of an act of Parliament. In the American War Lord Howe was desirous of having him with him in America; but Major Cartwright, although always eager for promotion in the navy, refused the proposal, alleging that he could not fight in a cause which he disapproved. From this time he devoted himself to the favourite objects of annual parliaments and universal suffrage. He was the author of a Declaration of Rights, distributed by the Society for Constitutional Information. The French revolution was warmly welcomed by Cartwright. In the trials of Tooke, Hardy, Thelwall, and other reformers, Cartwright was present as a witness, and displayed much firmness and fearlessness. By his writings, public addresses, &c., he continued to promote the work of reform and constitutional liberty; and as late as 1820 he was tried for conspiracy and sedition, for advising the inhabitants of Birmingham, which had then no parliamentary representative, to send what he called their 'legislatorial attorney' to the house; but he escaped with a fine of £100. Major Cartwright was not a political reformer only. The plan of making the slave-trade piracy is said to have been first developed in his Letters on the Slave-trade. The information which he furnished to Daines Barrington respecting the possibility of approaching the north pole, and several other useful projects and inventions, are evidences of his enterprise, activity, and knowledge. He died in 1824, in the eighty-fourth year of his age. A statue has been erected in London to his memory.

CARVER, JONATHAN, was born in Connecticut in 1732. He embraced a military career, and in the French war of 1756 commanded with reputation a company of provincials, in the expedition across the lakes against Canada. When peace was concluded in 1763, Captain Carver undertook to explore the vast territory which Great Britain had gained. His object was to acquire a knowledge of the manners, customs, languages, soil, and natural productions of the nations and region beyond the Mississippi, and to ascertain the breadth of the continent by penetrating to the Pacific over its widest part, between N. lat. 43° and 46°. He accordingly set out from Boston in 1766, and having reached Michilimackinac, the remotest English post, applied to Mr. Rogers, the governor, for an assortment of goods as presents for the Indians dwelling in the parts through which his course was to be directed. Receiving a portion of the supply which he desired, and a promise that the residue should be sent to him at the Falls of St. Anthony, he continued his journey. But not obtaining the goods at the appointed place, in consequence of their having been disposed of elsewhere by those to whom the governor had intrusted them, he found it necessary to return to La Prairie du Chien. He then, in the beginning of the year 1767, directed his steps northward, with a view of finding a communication from the heads of the Mississippi into Lake Superior, in order to meet, at the grand portage on the N.W. side of that lake, the traders that usually came about this season from Michilimackinac, from whom he intended to purchase goods, and then to pursue his journey. He reached Lake Superior in good time; but unfortunately the traders whom he met there could not furnish him with any goods, as they had barely enough for their own purposes, and, in consequence, he was obliged to return to the place whence he first departed, which he did in October, 1768, after remaining some months on the N. and E. borders of Lake Superior, and exploring the bays and rivers that empty themselves into that body of water. He soon after repaired to England with the view of publishing his journal and charts, and of obtaining reimbursement for the expenses which he had incurred. Having undergone a long examination before the lords commissioners of trade and plantations, he received permission to publish his papers; but when they were nearly ready for the press an order was issued from the council-board, requiring him to deliver immediately into the plantation-office all his charts and journals. He was, consequently, obliged to re-purchase them at a great expense from the bookseller to whom he had disposed of them—a loss for which he received no indemnification, but was forced to be satisfied with that obtained for his other expenses. He had fortunately kept copies of his papers, and he published them ten years afterwards in Boston, while in the situation of a clerk of a lottery. He died in want of the common necessaries of life in 1780, aged forty-eight years. His works are: Travels Through the Interior Parts of North America (1778); Treatise on the Culture of the Tobacco Plant (1779).

CARVIN, or CARVIN EPINOY, a town of France, in the department of Pas de Calais, about 15 miles E.S.E. of Bethune. Coal-mining is carried on in the neighbourhood, and sugar-making and distilling in the town; trade in alcohol, beet-root, sugar, coal, flax, and grain. Pop. (1891), 6805.

CARVING, as a branch of sculpture, is the art of cutting a hard body by means of a sharp instrument, and is a term generally employed in speaking of figures cut out in ivory or wood, in contradistinction to sculpture, or figures cut upon metal or stone. The art of carving is of the highest antiquity. It is frequently mentioned in the Bible. The prohibition in the second commandment against making any graven image evidently refers to it; and it was practised by all the civilized nations of antiquity, and most frequently in aid of religious observances, images or emblems of deity being created by it both for public and private devotion. Even among the most uncivilized tribes who have any external religious rites, rude representations of this kind are common. In Catholic countries carved images of saints and relics are still used, both in churches and for private devotion. Besides this almost universal use, carving was early employed for purposes of ornaments. Many eastern nations have excelled in it. India and China have long been famed for their artistic skill both in wood and ivory, particularly the latter. The ancient Babylonians practised the art, among other purposes, in the carving of heads for staffs and signet-rings. In the family of Abraham, who was a Chaldean, these ornaments appear, according to some allusions, to have been preserved. The pledges which Judah gave to Tamar (Gen. xxxviii.) include the staff and the signet-ring. Among the Greeks statues of the gods, carved in wood and overlaid, were common at an early period; later, plates of ivory were used for overlaying statues, and were also largely employed for smaller ornamental work. In the early and middle ages wood-carving became general for the decoration of Christian churches and altars. One of the most ingenious and useful purposes to which carving has been converted in more modern times is that of engraving wood-cuts or blocks for printing. See WOOD-ENGRAVING.

Carving has been applied to almost innumerable uses in manufactures as well as in art. Some of these applications have given way to the art of engraving in metal and other processes, but new ones are continually arising. One of the latest developments of the art of carving is the modern invention of carving by machinery. The first carving-machine was invented about 1800; and in 1829 a patent was taken out by Mr. Joseph Gibbs for a machine for the cutting of ornamental forms in low relief, which it executed with great accuracy. This machine was used in ornamenting the floors of Buckingham Palace. Other machines were afterwards invented by Mr. Irving and Mr. Cheverton. A machine patented in 1845 by Mr. Jordan is capable of copying any carved design that can be produced, so far as that is possible, by revolving tools; the finish is afterwards given by hand-labour. This machine has been used for the carved decorations of the interior of the Houses of Parliament. (For descriptions of the machines referred to see Dr. Ure's Dictionary of Arts, Manufactures, &c.)

CARY, Henry Francis, the translator of Dante, was born at Gibraltar on Dec. 6, 1772, his father being an officer in the army. In 1790 he entered Christ Church, Oxford, and he took orders in 1796. Before entering on his university course he had published some early poetical effusions not without merit. In 1796 he was presented to the vicarage of Abbot's Bromley, Staffordshire, and in 1800 he removed to Kingsbury, in Warwickshire, another living to which he had been presented. His studies while at college had embraced a wide range of Italian, French, and English literature, and in 1805 he gave proof of his Italian scholarship, as well as of his poetic powers, by the publication of the Inferno of Dante in English blank-verse, accompanied by the Italian text. The entire translation of the Divina Commedia was accomplished in 1812, and the work was now published complete, but it lay unnoticed for several years, till Samuel Taylor Coleridge drew attention to its merits. It has since been recognized as a standard English work. Mr. Cary subsequently translated the Birds of Aristophanes (1824) and the Odes of Pindar, and wrote a continuation of Johnson's Lives of the English Poets, and a series of Lives of Early French Poets. He was for some time curate of the Savoy, London, and in 1826 he was appointed assistant-keeper of printed books in the British Museum, which office he resigned in consequence of his being passed by on the appointment of Mr. Panizzi in 1837 to the office of keeper of the printed books. The government in 1841 granted him a pension of £200 a year as a recognition of his literary abilities, and he devoted himself henceforth to the annotation of a new edition of his translation of Dante, and to editing editions of the English poets Pope, Cowper, Milton, Young, &c. He died in London, 14th August, 1844, and was buried in Westminster Abbey.

CARYATIDS, or Caryatides, in architecture, a kind of pillars in the form of women dressed in long robes of the Grecian type. The name is of Greek origin. The goddess Artemis (Diana), who had a temple in Caryæ, a Peloponnesian city, was for this reason called *Karyatis.* In honour of her, virgins danced in a festive procession on an annual feast, which suggested to architects the idea of adopting the images of virgins to serve as columns. Thus Lessing and others explain the name and form of the caryatids. Another explanation of the origin of caryatids is the following:—The inhabitants of Caryæ allied themselves with the Persians in their war with the Greeks. The Greeks, on the successful termination of that struggle, exterminated the males of Caryæ, and reduced all the women to slavery. As a mark of infamy, and to perpetuate the memory of the transaction, the architects of the time made statues representing these women in the servile office of supporting entablatures. Both explanations are somewhat doubtful.

CARYOPHYLLACEÆ, an order of plants, of which the pink, named by botanists in early times *Caryophyllus*, and more recently *Dianthus*, may be considered as the type. The plants of this order are readily distinguished by their opposite undivided leaves, without stipules, the tumid articulations of the stems, and the disposal of the seeds upon a free central placenta, surrounded by several carpellary leaves. Several species are cultivated by florists; a few are used in medicine, and the *Saponaria officinalis* and *Lychnis diurna* yield a mucilage resembling soap.

CASA, Giovanni della, an Italian writer, of an ancient and noble family of Mugello, near Florence, was born in 1503, studied at Bologna, Florence, and Rome, and entered as an ecclesiastic into the service of the two cardinals Alessandro Farnese, the first of whom, in 1534, ascended the papal chair, under the name of Paul III. He rose through various offices in the church, including the archbishopric of Benevento, till Paul IV. made him his private secretary. He died probably in 1556. His most celebrated work is Galateo, ovvero de' Costumi, 1560, a manual of good-breeding, to which another book, Degli Uffizj communi tra gli Amici Superiori e Inferiori, forms a supplement. This last is a translation of his Latin treatise, De Officiis Inter Potentiores et Tenuiores Amicos. The best and most complete edition of his works appeared at Venice, 1752, in three vols. 4to.

CASALE-MONFERRATO, a city of Northern Italy, in the province of Alessandria, on the right bank of the Po, 18 miles N.N.W. of Alessandria. Its citadel, founded in 1590, was one of the strongest in Italy, but it is now dilapidated. In 1640 the Spaniards were defeated here by the Duc d'Harcourt, and the possession of the town was repeatedly contested by the Austrians and French during the wars of the first Napoleon. It was formerly the capital of Montferrat, is still the seat of a bishop, and has an interesting Romanesque cathedral. Pop. 18,573.

CASAL MAGGIORE, a town of Northern Italy, in the province and 22 miles E.S.E. of the city of Cremona (to which there runs a steam tramway), on the left bank of the Po. There are a cathedral and other churches, theatre, &c. The manufactures include pottery and glass-ware; and there is a trade in wine, grain, hemp, and cheese, which is celebrated. Pop. 15,648.

CASAL PUSTERLENGO, a town of Northern Italy, in the province of Milan, S.E. of Lodi. It has a trade in Parmesan cheese. This little town is beautifully situated in a fine plain between the Po and the Adda. In 1796 the Austrians were attacked here by the French, and driven back to Lodi. Pop. 6304.

CASANOVA, François Joseph, a painter, famous for his battle-pieces, born at London, 1727, went early to Venice with his parents, was in Paris in 1751, but after a brief stay went to Dresden, where he remained from 1752 to 1756. Here he copied the paintings of Wouvermans and other favourite painters. After this study he returned to Paris, acquired renown as a painter of battle-pieces, and was admitted into the Academy of Fine Arts in 1763. Notwithstanding his great successes, his debts obliged him to quit France. Catherine II. of Russia employed him to paint her victories over the Turks. He settled in Vienna about 1785, and died at Brühl, near that city, in 1805.

CASANOVA, Giovanni Jacopo, de Seingalt, elder brother of the preceding, born at Venice, 1725, known by his Memoirs as an adventurer who acted a prominent part in all situations, amongst all classes of society, and in all the large cities of Europe. He was the son of an actor and an actress, received the rudiments of his education in Padua, and made rapid progress in the Latin language, as well as in all other branches of learning. At sixteen he sustained his theses, in order to enter a legal seminary, but was soon expelled for an intrigue so scandalous that it caused him to be committed to prison. The influence of his mother procured him a place in the establishment of Cardinal Aquaviva, but he did not retain it long; and after visiting Rome, Naples, Corfu, and Constantinople, in the characters of diplomatist, preacher, abbot, lawyer, and charlatan, he was imprisoned at Venice, 'under the leads' in 1755, and escaped with marvellous address. In his travels throughout Europe he formed associations with many distinguished characters, Rousseau, Voltaire, Suvaroff, Frederick the Great, and Catherine II. His most celebrated work is his Memoirs already alluded to. Telling, like Jean Jacques Rousseau, of all his failings without any sign of repentance, he relates with a cynical freedom the whole of his extraordinary adventures, and presents a picture of society without conventional disguise. He died at Düx, in Bohemia, on 4th June, 1798. Besides his Memoirs, Casanova was the author of several works of history or imagination in French and Italian, which show the versatility of his genius. The most remarkable are Récit de sa Captivité (Prague, 1788), and a translation in verse of the Iliad. His memoirs were first published in French, in twelve volumes, Leipzig, Paris, Brussels, 1826-38.

CASAS, BARTOLOMEO DE LAS. See LAS CASAS.

CASAUBON, ISAAC, born Feb. 18, 1559, at Geneva, of a family from Dauphiny, was educated by his father, a clergyman. In his ninth year he spoke Latin fluently. In his nineteenth year he entered the university at Geneva, where he studied Greek, theology, the oriental languages, &c., and in 1582 succeeded Portus as professor of the Greek language. In 1586 he married the daughter of the famous printer Henry Stephens. In 1596 he accepted a professorship of Greek and belles-lettres at Montpellier, but held it only two years. In 1600 Henry IV. invited him to Paris. His Protestantism (those religious principles for which his father had left his country), the jealousy of other scholars, and perhaps his rather unyielding character, were the occasion of many unpleasant occurrences, for which, however, he was indemnified by the office of royal librarian. After the death of Henry IV. in 1610 he went to England on the invitation of the Archbishop of Canterbury, where he was received with distinction, was presented with a prebend in Canterbury Cathedral, and had a pension conferred on him by James I., with whom he was a great favourite. He died at London, July 12, 1614. He was buried in Westminster Abbey. Casaubon was a liberal theologian, a man of extensive learning, a good translator, and an excellent critic. As a critic, he commented on Diogenes Laertius, Aristotle, Theophrastus, Suetonius, Persius, Polybius, Theocritus, Strabo, Dionysius of Halicarnassus, Athenæus, Pliny the Younger, &c. Nearly all the ancient classics are indebted to his valuable researches. His profound dissertation on the satirical poetry of the Greeks and the satire of the Romans (De Satyrica Græcorum Poësi et Romanorum Satyra) deserves particular praise. His theological writings are of less value. His diary, which had been preserved by his son Meric, was published in 1850 under the title of Ephemerides. An admirable Life of Casaubon has been written by Mark Pattison.

CASAUBON, MERIC, son of the preceding, born at Geneva, 1599, likewise distinguished himself by his learning. He went to school at Sedan, and in 1611 followed his father to England, and studied at Eton and Christ Church, Oxford. He held successively several livings in the church, when the revolution, which brought Charles I. to the scaffold, deprived him of his income. Still he rejected the proposal of Cromwell to write the history of his time, as also the invitation of Queen Christina to live in Sweden. On the return of the Stuarts he was rewarded for his loyalty by restoration to his offices in the church, which he held till his death, 1671. Besides various works in Latin, he wrote several in English on theological and other subjects. He also wrote some critical works on the classics, a treatise De Verborum Usu (1647), &c.

CASBIN, or KAZVIN (also spelled *Casveen*, *Kasbin*, and *Kazbin*), a town of Persia, in the province of Irak-Ajemi, about 90 miles W.N.W. of Teheran. It is built of kiln-burned bricks, and had once a great number of elegant mosques and well-constructed bazaars, but a large proportion of the buildings are now ruinous and deserted, partly the result of repeated earthquakes. The manufactures include tanning, weaving, &c., and there is a considerable transit trade. There are many vineyards and gardens in the neighbourhood. Pop. estimated at 25,000.

CASCADE RANGE, a range of mountains in N. America, parallel to and about 120 miles from the Pacific coast, extending from the Sierra Nevada in California northwards through Oregon and Washington into British Columbia. The highest peaks are Mount Rainier in Washington, 14,526 feet, and Mount Shasta in the north of California, 14,440 feet. The name is derived from the cascades formed by the Columbia river in breaking through the range.

CASCARA SAGRADA, or SAGRADA BARK, the bark of a species of buckthorn (*Rhamnus Purshianus*) found in California. It is used as a tonic and aperient; and a sort of wine, called *Sagrada wine*, is obtained from it. The bitter bark of *Picraninia antidesma*, a simurabaceous tree of Central America, is known as *cascara amarga* or *Honduras bark*.

CASCARILLA BARK. See CROTON.

CASE, in grammar, a form, modification, or inflection of a noun or pronoun, indicating or corresponding to its relationship to some other word or words in a phrase or sentence, as, John (nominative case) speaks; John's (possessive) dog barks; John beats his dog (objective). In adjectives, case is merely sympathetic, the adjective agreeing in case with the noun which it qualifies. In English, nouns undergo only one inflection representing a different case from the nominative or general form of the noun; all other cases are represented either by prepositions or by the position of the noun in the sentence, the nominative case usually preceding the verb, the objective or accusative following it. The single inflected case in English is the possessive or genitive (John's). English pronouns have three cases—nominative, genitive, and accusative, as *he*, *his*, *him*. The last often serves as a dative. Adjectives undergo no modifications in English. In Sanskrit there are eight cases—nominative, accusative, instrumental, dative, genitive, ablative, locative, and vocative. In Latin there are six cases—nominative, genitive, dative, accusative, vocative, ablative. In Greek there are five, the ablative not being used. In both Latin and Greek there are traces of a locative case. In French, Italian, Spanish, and Portuguese, the nouns have no case-inflections. In German both nouns and adjectives are inflected for case. There are four cases in German—nominative, genitive, dative, accusative.

CASE, in letterpress printing. See PRINTING.

CASE, in law, has various meanings. In English law an *action upon the case* is one in which damages are sued for for some cause of complaint where the injury done is not direct, as in trespass, but consequential. A *case stated* is a statement prepared by one court for the decision of a point of law by a superior court. A *special case* is a written statement of facts agreed on by two or more litigants in an action, in order that a court may decide their legal effect.

CASE-HARDENING is a process by which iron is superficially converted into steel, in such articles as require the toughness of the former, conjointly with the hardness of the latter substance. The articles intended for case-hardening are first manufactured in iron, and are then placed in an iron box, with vegetable or animal charcoal in powder, and heated to redness. Immersion of the heated pieces in water converts the surface into a coating of steel, usually very thin, and which is afterwards polished. Various other methods of case-hardening are also used.

CASEIN, an albuminoid belonging to the class of derived albumins, insoluble in water and neutral saline solutions, but soluble in dilute acids and dilute alkalies. Casein exists in milk to the extent of 3·5 per cent on an average, and it is so named from being the characteristic component of cheese (Lat. *caseus*). It can be prepared from it in a variety of ways—by precipitation with hydrochloric or acetic acid, and extracting the butter by ether; by precipitation with sulphate of magnesia, washing with strong brine, removing the butter, and finally precipitating with acetic acid. In these and in other methods the chief difficulty is the complete removal of the butter, for even after twenty extractions with ether, fatty drops are still obtained. The oldest and best-known method is coagulation by means of rennet (which see) at a slightly elevated temperature. Casein, when dry, is a white or yellowish hygroscopic body, which reddens litmus and shows some of the other properties of an acid. Casein is generally precipitated from its solution by salts, but in milk it remains dissolved in presence of phosphate of sodium, even on neutralizing by acetic acid. It is distinguished from albumen by not coagulating by heat. When milk is boiled, a film of casein forms constantly on the surface, but this appears to be due merely to evaporation, and not to true coagulation; coagulation does not take place unless a considerable excess of acetic acid be added to the milk. A special preparation of casein in the form of a yellow powder known as *lactarine* is used as a mordant in dyeing and calico-printing.

CASEMATES (from the Spanish *casa*, a house, and *matare*, to kill), in fortification, vaults which are proof against bombs, and which may be constructed under a parapet and provided with embrasures or ports through which guns are fired. They may serve, at the same time, as a place for keeping the heavy ordnance and various stores, and in case of necessity as habitations for the garrison or shelter for sick or wounded.

CASERTA, a town in a province of the same name, South Italy, 14 miles north of Naples. It is the seat of a bishop, and contains many fine buildings. The principal edifice is a palace, a large and richly-decorated structure, commenced in 1752 by Charles III. of Spain, and situated among gardens adorned with numerous ancient and modern statues. The principal manufactures are silk goods, carpets, linen, &c. The district produces excellent fruit and wine. About 2½ miles to the north-east is Caserta Vecchia (Old Caserta), the new town being distinguished as Caserta Nuova. Pop. (1894), estimated, 35,600.

CASE-SHOT, in artillery, is formed by putting a quantity of small balls or bullets into a cylindrical tin box called a *canister*, that just fits the bore of the gun. In case of necessity, the canister is filled with broken pieces of iron, nails, stones, &c. The case is closed at both ends by a disc of wood or iron. Shot of this sort is thrown from cannons and howitzers, and is very injurious to the enemy, because the balls contained in the canister spread, diverging in proportion to the distance. The amount of divergence varies as the distance which the shot reaches. The balls vary in weight, according to the character of the ordnance, from one or two pounds to half an ounce each. The range within which case-shot are used sometimes extends to 500, but seldom exceeds 200 to 300 yards. It is also called *canister-shot*. The shrapnel-shell, in its present cylindrical shape, may be considered a variety of case-shot.

CASH, thin coins of a very base alloy of copper, perforated and strung on a thread, and used as small change in China. Twenty-two cash are equal to one penny.

CASHAN, a town, Persia. See KASHAN.

CASH CREDIT, a mode of advancing funds originated by the Scotch banks, and since adopted by others. A cash credit is an open account, on which a person may draw up to a certain fixed amount for which the bank requires security, and into which the person who receives the credit pays cash at his convenience, with the power of re-drawing it again up to the limit of his credit. The most common security is that of two cautioners or sureties, who bind themselves separately to become liable for the whole amount of the credit operated upon in the event of the failure of the original borrower. See BANK.

CASHEL, a town of Ireland, in the county of Tipperary, 95 miles by rail S.W. of Dublin. It consists of a principal and several minor streets of very indifferent appearance, but has a spacious cathedral, a handsome episcopal palace (now the deanery house), a diocesan library, a Roman Catholic church, court-house, barracks, hospital, market-hall, jail, &c. There is a large limestone rock here 300 feet high, known as the Rock of Cashel; on its summit is a round tower and the ruins of an ancient cathedral and other buildings. Pop. (1891), 3216.

CASHEW (*Anacardium occidentale*), a tree of the order Anacardiaceæ, common in the West Indies. It has alternate, obtuse, ovate leaves, and bears bunches of red, scented flowers. Its fruit is called the cashew-nut. The juice of the stem is used as a varnish; and an aromatic drug is prepared by a decoction and maceration of several parts of the tree, afterwards consolidated by evaporation. The nut is small, kidney-shaped, ash-gray, and is seated on the end of a large fleshy receptacle. It contains an acrid juice, but its noxious property is destroyed by roasting the nut before being eaten, and then it is esteemed a great delicacy. A wine is made from the fleshy receptacle; and a gum with properties similar to those of gum arabic is obtained from the plant.

CASHGAR, or KASHGAR, a town of Central Asia, in the Chinese Empire, capital of the province of Sin-Kiang or Kashgaria. It is situated on the Kizil-Daria or Kashgar river, 100 miles north-west of Yarkand, and comprises an old and a new town. The latter was built in 1838 and is strongly garrisoned. There are considerable manufactures of cotton, gold and silver cloths, carpets, &c., and an extensive trade, its position at the junction of several great routes making it the emporium of much of the commerce of Central Asia. It was the capital of an independent kingdom till conquered by the Chinese during the eighteenth century. (See also TURKESTAN.) Pop. about 62,000.

CASHMERE, or KASHMIR, a principality in the N.W. of Hindustan, subject to a Maharajah belonging to the Sikh race, but under British protection and supervision. It is composed of various provinces or districts, of which Cashmere proper is the most famous and interesting. It is situated in the southwestern portion of the state, and largely consists of an elevated valley intersected by the Jhelum. Besides Cashmere proper, the state embraces the territory of Jamoo, Balti or Iskardo, and Ladakh and Gilghit. The whole principality thus formed is estimated to cover about 80,900 square miles, and its population in 1891 was 2,543,952. It extends from about 32° to 37° N. lat., and from about 73° to 80° E. lon. The territory of Jamoo, which forms the most populous portion of the principality, lies to the N. of the Punjab, between the spurs of the Himalaya Mountains leading up to Cashmere and inclosed by the upper courses of the Chenab and Ravee. Its chief town is of the same name. Balti, also called Little Tibet, is an elevated region on the Upper Indus, to the N. of Cashmere proper, lying to the S.W. of the Karakorum Mountains, and having for its capital Iskardo or Skardo. Ladakh, also called Middle Tibet, lies to the S.E. of Balti, between the Himalaya and Karakorum Mountains, and is also traversed by the Indus. Its passes form some of the most important media of communication for Central Asia. Its capital is Leh on the Indus. Gilghit is a district on the N.W. of Balti. Cashmere and Jamoo is the official title of the whole. The principal river is the Indus, which traverses the state from S.E. to N.W., and then takes a sharp turn to the S.W. The upper course of the Chenab is also in the state. Cashmere proper is a valley surrounded by gigantic mountains, belonging to the Himalayas, and traversed by the river Jhelum (formerly Hydaspes). The whole area of the inclosed region is about 4500 square miles, and of the bottom of the valley about 2000 square miles. From three sides only seven passes lead to this region; to the E. the Himalaya presents an insurmountable barrier of snow. The splendour and sublimity of the diadem of snow-capped mountains, the beauty and richness of the hills which form the ascent to the higher peaks, it is impossible to describe. The elevated situation of the valley, and the mountains of snow which surround it, render the climate temperate; and it is, on the whole, pleasant and healthy. This region, about 5200 feet above the sea, is watered by numerous streams, and is blessed with an abundance of the finest productions. The Asiatics therefore call it the *paradise of India*, the *flower-garden*, and the *garden of eternal spring*, and such names. The hills are covered with forests and Alpine pastures; at the foot of these are fields of corn; along the sides of the rivers rice is planted; rich orchards extend over the foremost ranges of hills; mulberry-trees are cultivated in abundance for the support of silk-worms, and are entwined with vines, from whose grapes wine very similar to Madeira is prepared. The fruits of warm climates do not ripen here. The valley is famous for its flowers, with which all the gardens and meadows abound. Violets, roses, narcissuses, and innumerable European flowers, besides many that are not known in Europe, grow wild. The roses and jasmine yield the finest aromatic oils, which form an article of export. Two-thirds of the inhabitants are Mohammedans, the remainder Hindus. The capital, Cashmere (otherwise *Srinagar*, which see), is situated on the Jhelum, and has a pop. of 118,960, including the cantonments. It is a dirty, ill-built town, extending on both sides of the river for about two miles, with few noteworthy buildings. Jamoo is the winter capital. Besides agricultural and pastoral pursuits the inhabitants carry on certain manufactures, especially woollens and artistic metal work. The manufacture of the celebrated Cashmere shawls is not so extensive as it once was, since manufactories have been established at Amritsir, in the Punjab, and elsewhere, which compete successfully with those of Cashmere. The genuine Cashmere shawls, however, are said to be of a better quality, owing to the fact that they are made of wool from the wild goat and other wild animals, this wool being, properly speaking, a soft down with which all the animals of this region are clad during the winter season. The shawls are woven in stripes, which are afterwards very skilfully sewed together. Cashmere has had a varied history during the different periods distinguished as pro-Buddhistic, Buddhistic, Hindu, and Mohammedan. Buddhism, when driven from Hindustan, found a refuge in Cashmere. Mohammedanism was introduced in the fourteenth century. In 1586 the country was conquered by Akbar, and became part of the Mogul empire. In 1752 it was subjugated by the Afghans, under whom it remained till 1819, when it was conquered by the Sikhs. In 1846 the Sikh governor, Gholab Singh, made a separate treaty with the British, by which he acknowledged their supremacy, and agreed to lend them assistance when required. Accordingly he sent a contingent to act with the British forces against Delhi in 1857. A small annual tribute is paid to the British, partly consisting of Cashmere shawls. Under the supervision of the Indian authorities and the British resident at the court of Cashmere, great improvements in the internal condition of the state have recently been effected. The revenue system has been remodelled, and a new land revenue settlement has been completed. According to a recent blue book 'An impulse has in consequence been given to agricultural pursuits, cultivation has increased, and local industries in silk culture, vineyards, wine-factories, hop gardens, and orchards are being developed. . . . The posts and telegraphs in Kashmir have been taken over by the government of India, with the result of an increase in efficiency and of a saving in expense to the Kashmir state. The Kashmir troops have improved, and have shown their value in active service. Large expenditure has been incurred on public works, particularly on the improvement of the Jhelum and Gilghit roads, and on the construction in the capital, Srinagar, of waterworks.' A railway belonging to the Indian system now enters the country The inhabitants are a fine race physically, tall, strong, and well built, with regular features. About two-thirds of them are Mohammedans, the remainder mostly Hindus. Earthquakes frequently occur, and one that took place in 1885 caused the loss of thousands of lives.

CASHMERE (town). See SRINAGAR.

CASHMERE-GOAT (*Capra hircus*, var. *laniger*), a variety of the common goat remarkable for its fine downy fleece, said to be found in perfection only in Tibet, but also found elsewhere, as in Ladakh or Middle Tibet, now a province of the principality of Cashmere. It is found both in a wild state and as a domestic animal; the former is said to yield the best wool or down. The favourite food of these animals is said to be buds, aromatic plants, rue, and heath. The people of Tibet give the goats at least once a week some salt. If they are transferred from their cold mountainous abode into a warm country, the wool deteriorates. It grows very slowly in the warm part of the year, and more vigorously as the cold season approaches. The colder the region the heavier is the animal's fleece. Proper food and careful tending increase the fineness of the wool. Yearlings, as is the case with the merino sheep, afford the finest wool. A full-grown goat yields not more than 8 ounces. The goats which pasture in the highest vales of Tibet have a bright ochre colour. In lower grounds the colour becomes of a yellowish-white, and still farther downwards, entirely white. The goats of Tibet and Cashmere have the fine curled wool close to the skin, just as the under-hair of our common goat lies below the coarse upper-hair. The wool is shorn in the spring, shortly before the warm season—the time when the animal in its natural state seeks thorns and hedges in order to free itself from the burden of its warm covering. A large shawl of the finest quality requires 5 lbs. of the wool; one of the inferior quality from 3 to 4 lbs. The flesh of the Cashmere goat tastes as well as that of the common one, and its milk is as rich if it is well tended. The Cashmere goat was introduced into France for the first time by M. Huzard in 1818, and then a year or two later by MM. Joubert and Ternaux, but not with great success. In quite recent years, under the care of the Society of Acclimatization, more satisfactory results appear to have been obtained, but it is still doubted whether that fine fleece which gives its chief value to the animal can be preserved in a European climate. (See the previous article.)

CASIMIR III., the Great, King of Poland, born in 1309, son of Vladislaus Loketek, distinguished himself by his valour under the reign of his father, who had commissioned him to take revenge on the knights of the Teutonic order, and had made him regent of Great Poland. In 1333 he ascended the throne, and had many contests with the Teutonic knights; made himself master of Little Russia, which had formerly belonged to Poland; conquered Silesia (which, however, he ultimately ceded to the Bohemians on their king renouncing his claim to the crown of Poland); and repelled the Tartars, who had advanced to Poland. He died in 1370 without children, having named a son of the King of Hungary his successor in 1339. In 1347 he caused a new code of laws to be compiled, and protected the peasants with much energy, on which account he was called the *peasants' king*. He had a great number of mistresses, among whom was a Jewess named Esther, who procured for her nation those liberties which they enjoy in Poland to the present day. With Casimir the line of the Piasti, which had ruled in Poland for nearly 530 years, became extinct. From that time the crown of Poland was recognized as elective, and, as the Poles mostly chose foreigners for their kings, they thus laid the foundation of the troubles which distracted the kingdom till its final ruin.

CASINO, a name generally given to a kind of club-house or place of amusement, containing rooms for dancing, playing at billiards, &c. The word is originally Italian, being a diminutive of the Italian word *casa*, signifying a house; and was at first applied to small houses which the nobles of Florence, Venice, and other Italian cities often possessed at a distance from their ordinary residences, and which were devoted to purposes of social enjoyment.

CASINO, or Monte Casino, a celebrated Benedictine abbey in Italy, in the Neapolitan province of Caserta, near the small town of S. Germano, and about 45 miles from the city of Naples, founded by St. Benedict of Norcia in 529. It is situated on a mountain, from which it derives its name, near the ruins of the ancient Casinum, and is approached by a well-paved and winding road. The abbey, after having suffered repeated reverses, finally became considerable for its privileges and its wealth, and in the eleventh and twelfth centuries was the seat of science, particularly of medicine, the celebrated school of Salerno having been founded by the monks of Monte Casino. The church is very magnificent, although overloaded with ornament, and contains the tomb of the founder. The monastery has served as a place of refuge to several sovereigns and pontiffs, and was formerly much visited by pilgrims and travellers, who were entertained free of expense. It is still visited by travellers or tourists, but is no longer a conventual institution, being now devoted to education. The railway from Rome now passes near it.

CASIRI, Michael, a learned orientalist and Syro-Maronite clergyman, was born at Tripoli in Syria, 1710; came to Rome, where he studied in the College of St. Peter and St. Marcellino; and in 1734 entered the clerical profession. The following year he accompanied the learned Assemanni to Syria, where he was going, at the command of the pope, to attend the synod of the Maronites, and in 1738 gave, at Rome, an exact account of the religious tenets of the Maronites. He afterwards taught in his monastery the Arabic, Syrian, and Chaldee languages, theology and philosophy; and in the year 1748 was invited to Madrid, where he was appointed to an office in the royal library. In 1749 he devoted his attention, by the king's orders, to the library of the Escurial, of which he subsequently became the superintendent. Here he collected the materials for his celebrated work, Bibliotheca Arabico-Hispana (Madrid, 1760–70, two vols. folio), which enumerates in 1851 articles the manuscripts of the Escurial Library, perhaps the richest in Europe in Arabic manuscripts. This work, though not entirely free from errors, contains very important information and valuable extracts, and is indispensable to every orientalist. Casiri died at Madrid in 1791.

CASORIA, a town, Italy, province of Naples (Napoli), 6 miles N.N.E. of Naples. It has four fine churches, and is the residence of a district judge. Silk is produced in the neighbourhood. Pietro Martino the painter was born here. Pop. 9791.

CASPE, a town, Spain, Arragon, province of Zaragoza, 12 miles N.N.E. of Alcañiz, left bank of the Guadalupe, near its confluence with the Ebro, on several small hills and in the intervening valleys. It has paved streets, one principal and nine smaller squares, a handsome Gothic collegiate and two other churches, several chapels, three schools, a town-hall and prison in a suppressed convent, an hospital, and several public fountains. Manufactures—wine, oil, and soap. Some trade is also carried on in grain and cattle. Pop. in 1887, 8427.

CASPIAN SEA, a large lake or inland sea between Europe and Asia, now nearly surrounded by Russian territory, but having Persia on the south; 730 miles in length from N. to S., and from 130 to 270 in breadth; area about 170,000 square miles; the largest isolated sheet of water on the globe. The water is less salt than that of the ocean, of a bitter taste, and of an ochre colour, without ebb or flow. In some places it is exceedingly deep, yet it abounds in shallows, so as to prevent the navigation of ships which draw more than 9 or 10 feet of water. The level of the Caspian Sea is considerably lower than that of the ocean. Among the rivers which flow into it are the Volga, Ural, Terek, and Kur. In ancient times the Oxus (Amoo Daria) also flowed into it. It has no outlet. The fisheries here, which are very valuable, occupy and train many seamen. Sturgeons and sterlets are caught in great quantities, and there are also salmon-trout, perch, *Silurus glanis*, two kinds of carp, and porpoises; seals abound in the upper coasts, and tortoises between the mouths of the Volga and the Ural. In the northern region the first fishing season, called the caviar season, occurs between March and May, when the Volga, Ural, &c., are getting cleared of ice. The second season is in July, when the sturgeon descend the rivers; and the third or open-sea fishing goes on from September to November. The only ports at all worthy the name on or near the Caspian are Astrakhan, Baku, Derbend, and Astrabad, (in Persia). The navigation is at all times difficult and often perilous. Steam-packets are now established on this sea. The Russians have also a fleet of war-vessels in the Caspian, and a new naval station has been established at Krasnovodsk, on the east side of the sea. By means of river and canal there is water communication between the Caspian and the Black Sea, Baltic, and White Sea.

CASQUE. See Helmet.

CASSANDRA, also Alexandra, daughter of Priam and Hecuba, and twin-sister of Helenus. Both children, according to tradition, were playing in the vestibule of the temple of the Thymbræan Apollo, not far from Ilium; and having stayed there too late to be carried home, a couch of laurel twigs was prepared for them, for the night, in the temple. When the nurses went to them the next morning they found two serpents at the side of the children, which, instead of injuring them, harmlessly licked their ears. This miracle produced a still greater one: the hearing of the children was rendered so acute that they could distinguish the voices of the gods. Cassandra subsequently spent much of her time in the temple of Apollo, who, becoming enamoured of her charms, disclosed to her all the secrets of the prophetic art, and in return demanded her love. But Cassandra, when her curiosity was satisfied, refused the dishonourable reward. Apollo, incensed at this, solemnly decreed that her prophecies should never find belief. She frequently and continually foretold the destruction of Troy, and warned her countrymen in vain against the deceitful horse. When Troy was conquered, and Cassandra, with the other maidens, fled to the temple of Minerva, Ajax, the son of Oïleus, tore her from the altar, deflowered the virgin in the sacred place, and dragged her away to the other female slaves, with her hands tied. On the division of the booty she fell to Agamemnon, who carried her as his slave and mistress to Mycenæ. Clytæmnestra murdered them both. Agamemnon had twins by her—Teledamus and Pelops, who were put to death by Ægisthus. The ancients regarded this rape of Cassandra as a most infamous atrocity. It has often afforded a subject to poets and sculptors. The Locrians, the countrymen of Ajax, were afflicted on this account for many years with storms, and their country was desolated with the plague.

CASSANO, two towns in southern Italy.—1. A town, in the province of, and 32 miles N.N.E. of Cosenza, finely situated. It is the seat of a bishopric, and has a cathedral, a hospital, and an old castle on an almost inaccessible rock with a splendid view. The district produces cotton, liquorice, grain, fruit, silk, and soda; and the inhabitants manufacture maccaroni, leather, &c. In the vicinity are hot sulphurous springs, and plaster and stone quarries. Pop. 7456.—2. A town, province of Bari, 12 miles N.E. of Altamura, with a parish church, a hospital, charitable institutions, and manufactures of copper utensils. There is here a stalactite grotto. Pop. 4098.

CASSANO D'ADDA, a town in Italy, in the province of Milan, and 16 miles N.N.E. of the town of Milan, pleasantly situated on a hill on the right bank of the Adda. It is very old, and built mostly of bricks. A bridge of 800 paces connects it with the opposite bank of the river. There are numerous silk-mills. Its military position on the right bank of the Adda has caused it to be the scene of several battles. Here Ezzelino da Romano, the leader of the Ghibellines in Italy, in the time of the Emperor Frederick II., was defeated in 1259; here also Prince Eugene was defeated in 1705, by the Duke de Vendôme, and the French under Moreau, by Suwarow in 1799. Pop. 3312.

CASSAS, Louis François, landscape-painter and architect, born at Azay-le-Ferron in 1756, went to Italy when very young, and carried with him a collection of views from nature, which he afterwards enlarged by others taken in Sicily, Istria, and Dalmatia. He next accompanied the Count of Choiseul Gouffier, ambassador to Constantinople, compared the topography of Troy with the accounts given of it by the ancients, took drawings of the remains and the surrounding country, and travelled through Asia Minor, Syria, Palestine, and part of Egypt. On his return he was appointed inspector and professor of design at the Gobelins in Paris. The models which he had made of the most celebrated architectural works of different countries were purchased by Napoleon, who rewarded him with a pension, and caused them to be placed in the Parisian School of Arts. From the materials collected in his travels have been compiled, Voyage Pittoresque de la Syrie, de la Phénicie, de la Palestine et de la Basse Égypte (1799), and Voyage Historique et Pittoresque de l'Istrie et de la Dalmatie (1802, with sixty-nine copper-plates). The original drawings for both works were admirable oil paintings, and they were deposited in the Bibliothèque Royale. Cassas was invested with several orders of knighthood, and died in 1827.

CASSATION, a term used in the courts on the continent of Europe. It is derived from the middle ages, and signifies the annulling of any act or decision, if the forms prescribed by law have been neglected, or if anything is contained in it contrary to law.

CASSATION, Court of (*Cour de Cassation*), one of the most important institutions of modern France, which gives to the whole jurisdiction of that country coherency and uniformity, without endangering the necessary independence of the courts. It was established by the first national assembly, and has been preserved, in every essential respect, under all the changes of the revolution and restoration. It has been maintained even in those districts which, by their union with France, became subjected to French laws, but by the Peace of Paris again became part of the Prussian monarchy. In France, as early as the reign of Louis IX. (1226–70), petitions were presented to the king by appellants from the decisions of the courts. In later times appeals to the parliaments, as the highest courts of the kingdom, came into use, and their decisions were not liable to be set aside by the ordinary forms of law. Yet the parties were allowed to dispute even these decisions if they were founded upon errors of fact, or violated undisputed principles of law; and by an ordinance of 1302 it was provided that the parties should be allowed royal letters for the defence of their rights against the decisions of the supreme courts (*lettres de grâce de dire contre les arrêts*), which should be issued from the chancery (by the chancellor of France). The case was then sent back to the parliament for further investigation, but was examined and decided in the presence of the king himself, or of a special commissioner. An abuse, however, crept in of transferring these cases to the royal council, where they were decided by officers called *maîtres des requêtes*. These letters received the name of *lettres de proposition d'erreur*, and during the civil commotions at the end of the fourteenth century began to be more frequently presented to the council, which, as soon as one party complained of the partiality of the parliaments, transferred the case to its own bar, and obstructed the course of justice by *lettres d'état* (suspensions of the process, on the pretext of the absence of one of the parties in the service of the king). Under the Chancellor Poyet (1538–42), this abuse reached its highest pitch; but the Chancellors Olivier (1545–51) and Hôpital (1560–68), the two great reformers of French jurisprudence, limited the use of these *lettres*, till, by the ordinance of Blois (1576), all the provisions against the decisions of the parliaments were reduced to these three:—the *proposition d'erreur*, for an error of fact; *requête civile*, to restore the parties to their former condition on account of the fraud of one of the parties, or the mistakes of the attorney; and *cassation* (petition for abrogation), for violation of forms or settled principles of law. By the famous order of procedure of 1667 the first of these provisions was abolished, but the province of the *requête civile* and *cassation* was enlarged and more precisely defined. The former was always brought before the court itself and decided there, the latter before the council. For this purpose, in the *conseil privé*, or *cons. des parties*, a particular committee was formed, consisting of the chancellor, the four secretaries of state (ministers of the departments), the council of state, and all the *maîtres des requêtes* (in 1789 seventy-eight in number). The decisions of this committee were too much influenced by the will of the king and the ministers, and by various other circumstances, so that they did not enjoy great respect, though they often exposed acts of great injustice on the part of the parliament and other high courts. It was therefore abolished in the first national assembly, and its place supplied by an independent court—the *tribunal of cassation* (decrees of Nov. 27 and Dec. 1, 1790), which was retained in all the constitutions and received under the imperial government (1804) the name *Court of Cassation*, which it still retains. It consisted, according to the organization of 1800, of forty-eight members, chosen from the senate, on the nomination of the consuls, who elected their own president from among themselves. The appointment of president was afterwards vested in the emperor. In the Charte Constitutionelle of 1814 the number of members of the Court of Cassation was fixed at forty-nine, at which it still remains. The members are appointed for life by the president of the republic, and consist of a first president, three presidents of sections, and forty-five councillors, besides certain honorary members. The minister of justice, or keeper of the seals (*garde des sceaux*) has the right of presiding on certain occasions. This court never decides on the main question at issue, but on the competency of the other courts, and on the petitions to have their decisions reviewed or annulled, and assigns the question to another court, if a decision is to be set aside for an evident violation of the forms or the principles of the law. For this purpose it is divided into three sections or chambers:—the *chambre des requêtes*, which decides on the admissibility of the petitions in civil cases; the *chambre de cassation civile;* and the *chambre de cassation criminelle*. After a decision has been reversed, if a second court decides the same case in the same way, and an appeal is entered again, the court of cassation must either request an authentic explanation of the law from the government, or at least all the three sections must unite, to pronounce a second reversal or cassation; and if a third decision is the same as the preceding, the court before which the case is again brought must submit to the doctrine of the court of cassation on the point of law in dispute. This system, which dates from April 2, 1837, gives great authority to this court in matters of jurisprudence. According to the law in force before 1837, the court before which a case was brought for decision a third time was not required to adopt the views of the court of cassation, but after the third decision there was no further appeal. The government, however, in that case gave an authentic interpretation of the law if there was any occasion for so doing. Until the end of 1852 there was a similar court of cassation for the Prussian province of the Rhine, but in 1853 its jurisdiction was transferred to the supreme Prussian tribunal sitting at Berlin. The sentences of the court of cassation are not only recorded in the journals of the courts, the decisions of which are reversed, but published likewise in an official bulletin, by which consistency and uniformity are preserved. The tribunal of cassation has enjoyed from its commencement the respect and confidence of France, and numbered among its members several of the most distinguished lawyers; as the president Henrion de Fansey, the councillors Chabot, Merlin, and Carnot.

CASSAVA, or Manioc. The cassava or manioc (*Jatropha manihot*) is a South American shrub, about 8 feet in height, with broad, shining, and somewhat hand-shaped leaves, and beautiful white and rose-coloured flowers, belonging to the natural order Euphorbiaceæ, sub-order Crotoneæ. It is a remarkable circumstance that the roots of the cassava, if eaten raw, are a fatal poison both to man and beast, and that, when prepared by heat, they yield a safe and valuable food, on which, indeed, many both of the Indian and European inhabitants of South America almost wholly subsist. The roots are the only edible parts of the plant. These are white, soft, and farinaceous, from 1 to 2 feet in length, and 5 or 6 inches in circumference. They are dug out of the earth, washed, stripped of their rind, and ground to a pulp. The juice, or poisonous part, is carefully pressed out, and when boiled becomes the delicious sauce called cassaripe, so much esteemed by epicures. Careful examination of the juice seems to show that the poisonous action is due to prussic acid. The flour that remains after pressure is formed into thin, round cakes, and baked. To a European accustomed to eat bread, these, though sweetish and not unpalatable, have an insipid taste. If placed in close vessels, and preserved from the attacks of insects, cassava bread may be kept for several months without injury. With the natives of South America it is not unusual to throw a great number of cakes of cassava together to heat, after which they soak them in water, which causes a rapid fermentation to take place; and from the liquor thus obtained they make a very sharp and disagreeable, but intoxicating beverage, which will not keep longer than twenty-four hours without spoiling. From the pure flour of cassava is formed the substance called *tapioca*, which is frequently used for jelly, puddings, and other culinary purposes. This is separated from the fibrous parts of the roots by taking a small quantity of the pulp after the juice is extracted and working it in the hand till a thick, white cream appears on the surface. This, being scraped off and washed in water, gradually subsides to the bottom. After the water is poured off the remaining moisture is dissipated by a slow fire, the substance being constantly stirred, until at length it forms into grains about the size of sago. These become hard by keeping, and are the purest and most wholesome part of the cassava. The roots of another species of this shrub, called *sweet cassava*, the juice of which is not poisonous, are usually eaten with butter, after being roasted in hot ashes. They have much the flavour of chestnuts, and are an agreeable and nutritive food.

CASSEL (ancient *Castellum Menapiorum*), a town, France, department of Nord, on an isolated conical hill in the centre of a large and fertile plain, 28 miles north-west of Lille. It existed in the time of Julius Cæsar, and at an early period was surrounded by fortifications, of which only vestiges now remain. Mount Cassel, on which the town stands, commands a most extensive view, and was one of the principal stations in the French trigonometrical survey. The Prince of Orange, afterwards William III. of England, was defeated here by the Duke of Orleans in 1677. It was ceded to France by the Treaty of Nijmegen in 1678. Pop. (1896), 3562.

CASSEL, or Kassel, formerly the residence of the Elector of Hesse-Cassel, and now the chief town in the Prussian province of Hessen-Nassau, lies on the Fulda, 91 miles n.n.e. of Frankfort-on-the-Main. It is divided into the Altstadt, or Old Town; the Ober Neustadt, or Upper New Town; the Unter Neustadt, or Lower New Town; and the new West Quarter; all but the third being on the left bank of the river. Cassel has several fine squares, or open areas, on the principal of which, the Friedrichsplatz, stands the electoral palace, an indifferent structure; and next to it the museum, a handsome building, containing a library of 170,000 vols. and many valuable MSS. At one end of this area is a handsome triumphal arch and war monument overlooking the Fulda valley, in which is the Karlsaue, finely laid out, and forming a favourite promenade. On this side of the city are also the building for the courts and government offices, the Bellevue palace containing the academy of arts, and the handsome picture-gallery containing some fine examples of the old masters, especially the Flemish and Dutch. The other more noticeable public areas are the Königsplatz, in the form of a circle; the Friedrich-Wilhelmsplatz, with an ornamental fountain; the Ständeplatz, a broad tree-planted avenue, &c. The most noteworthy church is the Protestant church of St. Martin, with a nave of the fourteenth and a choir of the fifteenth century. An observatory is likewise situated here. Cassel has iron-foundries and machine-shops, works for railway-carriages, mathematical instruments, pianos, gloves, jute works, &c. In the vicinity is Wilhelmshöhe, the ex-elector's summer palace, the temporary residence of Napoleon III. after Sedan. Pop. (1895), 81,752.

CASSIA, a genus of leguminous plants, of the tribe Cæsalpineæ, inhabiting the tropical parts of the world, consisting of trees, shrubs, or herbs, the leaflets of several species of which constitute the well-known drug called senna. That imported from Alexandria is obtained from *C. acutifolia* and *C. obovata*. *C. Fistula* is found wild in India. Its legumes contain a quantity of thick pulp, which is a mild laxative, and enters into the composition of the confection of cassia and the confection of senna. The leaves and flowers are also purgative. The bark and roots of several of the Indian species are much used in medicine. *Cassia bark* is a common name for the bark of an entirely different plant, *Cinnamomum Cassia*, belonging to the laurel family. It is much imported into Europe, mostly from China, and is also called *Cassia lignea*. Its flavour somewhat resembles that of cinnamon, and as it is cheaper it is often substituted for it, but more particularly for the preparation of what is called oil of cinnamon. The cassia of the Bible was probably cassia bark. *Cassia buds*, which are similar in flavour, are the unripened fruits of this tree.

CASSIANUS, otherwise called Joannes Massiliensis and Joannes Eremita, an early theological writer and zealous advocate of the monastic system, who flourished in the early part of the fifth century, but so little is known of the time and place of his birth that it is still doubtful whether he was a Scythian, Greek, or Roman. It is certain, however, that he travelled extensively in the East, and was long a pupil and deacon of Chrysostom. When the latter, through the intrigues of his opponents, was removed from the episcopal chair, Cassianus was sent with Germanus to Rome to present a memorial from the clergy who adhered to Chrysostom. Here he became personally acquainted with Pelagius. About 415 he went to Marseilles, where he continued a course of restless activity as a presbyter till his death, which took place some time between 430 and 450. He founded two monasteries on the principles laid down by him in his works De Institutis Cœnobiorum and Collationes Patrum Sceticorum (that is, Conferences of the Monks in the Desert of Sketis). The views advanced in these works, and still more the strong leaning which he showed to the dogmas of Pelagius, involved him in a controversy with Augustine. He ultimately modified his opinions so far as to adopt the system to which theologians have given the name of Semi-pelagianism, holding that man, since the fall, is not absolutely incapable of good, but, on the contrary, both derives from nature the seeds of virtue, and is able of himself to commence their primary development, though he requires the aid of divine grace to bring them to maturity. These views found great favour with the monks of France, and long maintained their ground in opposition to the efforts of Augustine and his friend Prosper of Aquitania. He was canonized, his festival day being July 25th. The best edition of the works of Cassianus is that of Frankfort (1722, fol.).

CASSICUS, an American genus of insessorial birds, the Cassicans, of the family Icteridæ (American Orioles), allied to the starlings, remarkable for the ingenuity with which they weave their nests. *C. cristatus*, sometimes called the crested oriole, a South American bird, constructs a pouch-shaped nest of the length of 30 inches.

CASSINI, a name famous in the history of astronomy and geography for three generations.

1. Giovanni Domenico, born June 8, 1625, at Perinaldo, near Nice, studied at Genoa with the Jesuits. Chance turned his attention to astronomy, in which he made such rapid progress that in 1650 the senate of Bologna bestowed on him the first professorship of astronomy at the university. A meridian had been drawn by Ignatio Dante (1575) in the church of St. Petronia in that city. In 1653 Cassini conceived the idea of extending and correcting it. In two years he completed this difficult task, the first-fruits of which were more correct tables of the sun, a more precise determination of its parallax, and an excellent table of refractions. By an observation at Città della Piave he discovered the shadows cast by the satellites of Jupiter on the disk of that planet when they are between it and the sun. By means of these he corrected his theory of the motion of the satellites, and determined the period of Jupiter's revolution. In 1668 he published his Ephemerides of the Satellites of Jupiter. In 1673 Colbert prevailed on him to settle in France. He discovered four new satellites of Saturn and the zodiacal light, proved that the axis of the moon is not perpendicular to the plane of the ecliptic, and showed the causes of her libration. The laws of this motion, which he determined with much accuracy, are one of his finest discoveries. He also wrote observations on the Indian calendar. The meridian commenced by Picard and Lahire was continued by Cassini in 1700 to the extreme limits of Roussillon, and when measured 100 years later showed a difference of only 21 toises (about 134 feet). He died Sept. 14, 1712, having lost his sight some years before. His Opera Astronomica was published at Rome in 1666

2. Jacques, son of the preceding, born at Paris in 1677, was admitted into the Academy of Sciences in 1694. After several essays on subjects in natural philosophy, &c., he completed his great work on the inclinations of the orbits of Saturn's satellites and ring. His labours to determine the figure of the earth are well known. The first measurement of 1718 made the degrees of the meridian shorter towards the north than towards the south, whence it was concluded that the earth was an oblong spheroid. Cassini continued the measurement, and maintained this opinion in his work De la Grandeur et de la Figure de la Terre (Paris, 1720). In order to settle the question the Academy was commissioned in 1733 to measure the whole length of France from Brest to Strasburg. Cassini directed this undertaking, but was led into some errors by the defective instruments of former observers. He died in 1756 at Thury, in the department of Oise. The astronomical tables which he compiled were published at Paris in 1740.

3. Cassini de Thury, César François, son of the preceding, born at Thury in 1714, member of the Academy from his twenty-second year, director of the observatory in 1756. He undertook a geometrical survey of the whole of France. When the support of the government was withdrawn in 1756, Cassini formed a society for advancing the requisite sums, which were to be repaid by the sale of the maps constructed from the survey. The work was almost entirely finished when he died in 1784.

4. Cassini, Jacques Dominique, Count de Thury, son of the preceding, born at Paris, 1747, was director of the observatory and member of the Academy, and was a statesman of ability as well as a mathematician. In 1789 he completed the topographical work which was begun by his father, and which in its complete state consists of 180 sheets. The Atlas National was a reduction of it on a scale of one-third. Cassini was arrested by order of the revolutionary tribunal. He escaped with life, but lost the copperplates of the Carte de France, which had cost 500,000 francs. Napoleon made him a count of the empire. He died in 1845.—His son, Alexandre Henri Gabriel, Comte de Cassini, born 1784, died 1832, was a lawyer who gained some fame as a botantist.

CASSINO, a game at cards in which four are dealt to each player, four being also placed on the board. The object is to take as many cards as possible by making combinations. Thus a ten in the player's hand will take a ten from the board, or any number of cards which can be made to combine into tens. The greatest number of cards reckons three points, and of spades, one; the ten of diamonds, two; the two of spades, one; and each of the aces, one.

CASSIODORUS, or Cassiodorius, Magnus Aurelius, a learned Roman, lived at the time of the dominion of the Ostrogoths, and contributed to the promotion and preservation of learning. He was born at Squillace (Scylaceum) in the latter half of the fifth century A.D., filled several public offices in Rome, and became chief minister of the Ostrogoth king Theodoric, but in 524 voluntarily retired from the court. Recalled after the death of Theodoric, he resumed his former office, which he held until the downfall of the Ostrogoths was inevitable, when he again withdrew to his native province (about 540), where he founded a monastery. Here he lived till his death, which took place probably about 575 or 580, when he was 100 years old. He made the monks of his convent copy the manuscripts of the ancient authors, and his book De Artibus ac Disciplinis Liberalium Literarum, in which he treated of the *trivium* and *quadrivium*, and inserted extracts from the ancient classic literature, was of much value in the middle ages. His Variarum Epistolarum Libri XII. is a collection of his official letters or state-papers written while he was secretary under four Gothic rulers. The text has been published in the Monumenta Germaniæ Historica. He likewise composed De Rebus Gestis Gothorum (a History of the Goths), of which we have an epitome by Jornandes, and several theological works of little importance. Another of his works is a meagre chronicle narrating the history of the world down to A.D. 519 His collected works were published by D. Garet at Rouen in 1679, and this edition was reprinted at Venice in 1729. Dr. Thomas Hodgkin has published a condensed English translation of his Letters with a valuable introduction. See also the same writer's Italy and her Invaders.

CASSIOPEIA, or Cassiepeia, in Greek mythology, daughter of Arabus and wife of Cepheus, to whom she bore Andromeda. She dared to compare her daughter's beauty to that of the Nereids, who, enraged thereat, besought Poseidon for vengeance. The god, in compliance with the request of the water-nymphs, laid waste the dominions of Cepheus by means of a deluge and a dreadful sea-monster. See Andromeda.—In astronomy Cassiopeia is a conspicuous constellation in the northern hemisphere, situated next to Cepheus. In 1572 a new and brilliant star appeared in it, which, however, after a short time, gradually diminished, and at last disappeared entirely. The constellation Cassiopeia contains fifty-five stars, five of which, arranged in the form of a W, are of the third magnitude.

CASSIQUIARI, or Cassiquiare, a deep rapid river of South America, in Venezuela, branching off from the Orinoco, and forming a water-way by which that river has navigable communication with the Rio Negro. It leaves the Orinoco in lat. 3° 10′ N.; lon. 66° 20′ W., about 20 miles W. of Esmeralda, and, after a S.W. course of 128 miles, falls into the Rio Negro near San Carlos, in lat. 2° 5′ N.; lon. 67° 40′ W. It is estimated to carry off about a third of the water of the Orinoco, being a hundred yards broad where it leaves that river, and about 600 yards at its junction with the Rio Negro. By means of this river, the Rio Negro, the Amazon and its tributaries, it is practicable to sail from the interior of Brazil to the mouth of the Orinoco.

CASSITERIDES, a name derived from the Greek *kassiteros*, tin, and anciently applied, but with no uniformity or precision, to the tin district of Cornwall, to the Scilly Isles, or to small islands off the north-west coast of Spain.

CASSIUS, the name of an ancient Roman family, originally patrician, but afterwards plebeian. Of the patrician branch the only famous name is that of Spurius Cassius Viscellinus, who proposed the first agrarian law, and in consequence lost his life. He had been thrice consul, and had taken an active part in the wars against the last Tarquins, but when he began to insist on an equal partition of the conquered lands he drew upon himself he hostility of the patricians. They accordingly charged him with treason, and he was condemned and beheaded. Another account is that he was accused and sentenced to death by his own father.

CASSIUS, Andreas, a physician who flourished during the seventeenth century. He graduated at Leyden in 1632, was physician to the Duke of Holstein and Bishop of Lübeck, and died at Hamburg in 1673. His name is best known in connection with a purple colour obtained from gold, which was briefly described in a treatise published by his son in 1685. See Purple of Cassius.

CASSIUS LONGINUS, Caius, the friend of Brutus, was the quæstor of Crassus, and preserved the few troops of that general who escaped from the bloody battle with the Parthians. With these he defended Syria against the Parthians till the arrival of Bibulus. In the famous civil war that broke out between Pompey and Cæsar he espoused the cause of the former, and, as commander of his naval forces, rendered him important services. When Cæsar, after the victory of Pharsalia, was in pursuit of Pompey, he advanced with a few vessels, while crossing the Hellespont, against a fleet of seventy sail commanded by Cassius, and called upon him to surrender. The latter, astonished by his daring courage, surrendered at his summons. Cæsar pardoned him, and afterwards bestowed various honours on him; but Cassius, who had always cherished feelings of bitter hatred towards Cæsar, joined in the conspiracy against him, and, with the aid of several fellow-conspirators, assassinated him, B.C. 44. He then, together with Brutus, raised an army to maintain the cause of their faction. They were met by Octavianus and Antony, who professed themselves the avengers of Cæsar, at Philippi. The wing which Cassius commanded being defeated, he imagined that all was lost, and killed himself, B.C. 42. See BRUTUS and CÆSAR.

CASSIVELLAUNUS (in Shakspere's Cymbeline, CASSIBELAN), a noble and warlike British chief of the Catuvellauni, who, when Cæsar invaded Britain in 54 B.C., held sway over several tribes living to the N. of the Thames, and led the resistance to the advance of the Roman general. Having advanced to the Thames, Cæsar found the Britons under Cassivellaunus posted on the north bank of the river prepared to dispute his passage. He crossed, however, without much difficulty, but the British charioteers persistently harassed his line of march. The Trinobantes, a tribe of Essex and Middlesex, soon sent in their submission to Cæsar, and as their example was followed by others, Cassivellaunus found himself unable to oppose resistance to the Romans. His stronghold, which contained many cattle, was captured by Cæsar; and an attempt made to storm Cæsar's naval camp proving unsuccessful, Cassivellaunus sued for peace, gave hostages, and promised an annual tribute.

CASSOCK, a name formerly applied to a long loose gown worn over the other garments, in which sense the word is found in Shakspere. It is now applied to a tight-fitting coat worn under the gown or surplice by the clergy. The cassock is generally black; but in the Church of Rome only the ordinary priests wear black cassocks, those of bishops being purple, of cardinals scarlet, and that of the pope white.

CASSOWARY (*Casuaridæ*), a family of birds placed by modern systematic writers among the Brevipennes, Cursores, or Ratitæ (Huxley), their affinities being greatest to the ostrich, rhea, &c., among living, the moa and others among extinct, birds. The shortness of their wings totally unfits them for flying, and it would seem impossible for nature to have furnished muscular power sufficient to move wings large enough to sustain their great weight in the air. As in others of this group, the pectoral or wing muscles are comparatively slight and weak—the breast-bone having no keel by which, as in other birds, the surface for the attachment of muscles is increased—while those of their posterior limbs are very robust and powerful. The wings of the ostrich are of some assistance to it in running, but those of the cassowary are too short even to be of service in this way. Indeed its whole plumage is so poorly supplied with feathers as to resemble, at a little distance, a coat of coarse or hanging hair. The cassowaries have three toes, all provided with nails. The cassowaries are commonly divided into two genera—*Casuarius* and *Dromæus*, the former, or cassowaries proper, having a long compressed bill, a bony crest or helmet on the head, and stiff featherless quills on the wings; the latter having a broader and shorter bill, feathers on the head, and no rudiment of the wing visible externally. Several species of both genera are known, and of these one of the most familiar is the *galeated* or *helmeted* cassowary of Ceram (*C. galeatus*), which has a laterally compressed beak, the head surmounted by an osseous prominence, covered with a sort of horny helmet; the skin of the head and superior part of the neck is naked, of a deep-blue and fiery-red tint, with pendent caruncles or wattles. There are some naked rigid quills on the wings, which are used as weapons of defence. The inner toe-nail is the largest of all. The ostrich is the only bird which surpasses the cassowary in size and strength. From the form of its head and bright eyes the cassowary is of a fierce and threatening aspect. This, however, is not a true indication of its character, which is rather timorous and shy. It is about 5½ feet long from the tip of the bill to the extremity of the longest claw. The head and neck together measure 18 inches, and the largest toe, including the claw, is 5 inches long. The claw of the inner toe is 3½ inches long. All the feathers of the cassowary are of the same kind, being entirely designed for covering, and externally are all of one colour. They generally grow double, having two long shafts growing out of a short one attached to the skin. In this genus the second or *aftershaft* is as long as the first. The double feathers are all of unequal length, some on the rump being 12 or 14 inches long, while others are only 3. The stem or shaft is flat, shining, black, and knotted below, having a beard arising from each knot. The beards at the ends of the large feathers are perfectly black, and towards the root of a tawny gray. The feathers on the head and neck are so short and scattered that the skin appears naked, except towards the hind part of the head, where they are somewhat longer. The wings without the feathers are not more than 3 inches long. The rigid quills or prickles already mentioned are five; the longest is 11 inches in length, and a quarter of an inch thick at the base. The helmet is black in front and yellow behind. The eye is of a bright-yellow, and more than 1 inch in diameter. The anatomy of the cassowary differs very materially from that of the ostrich, which it resembles so much in general appearance. The intestines are short and the *cæcum* small; there is no stomach intermediate to the crop and gizzard, and the *cloaca* is not larger, in proportion, than that of other birds. It feeds on fruits, eggs of birds, &c., and inhabits forest districts. As might be inferred from its structure, the cassowary is a swift runner, and its mode of progression, being unaided by wings, is as peculiar as it is efficient. In running, the cassowary appears to strike out powerfully with one leg, so as to project its body violently forward with a bounding motion, far surpassing the speed of a horse. It also kicks violently when, in a state of captivity, it is provoked to anger, and can inflict a very severe blow. The eggs of the galeated cassowary are green, and are neither so round nor so large as those of the ostrich. The shell is marked by numerous little deep-green tubercles. The largest of their eggs measure about 15 inches in length and 12 round. Other species of this genus are *C. australis*, the Australian cassowary, inhabiting Northern Australia, and resembling the bird above described; *C. beccarii* and *C. bicarunculatus* of the Aru Islands, *C. uniappendiculatus* of New Guinea and Salwatti, *C. papuanus* of Northern New Guinea, *C. Bennetti* of New Britain. (See Pl. V., figs. 4, 5, 6, at ORNITHOLOGY.)

The *emeu*, or *New Holland cassowary* (*Dromæus* *novæ Hollandiæ*, Gray), differs from the helmeted cassowary by being much larger, and standing higher on its legs, being 7 feet 2 inches in length. The head is destitute of the helmet, and feathered throughout, except around the ear. The plumage is thicker, and the webs of the feathers more perfect. It has neither caruncles to the neck nor prickles on the wings. The nails of the toes are nearly equal. The legs are stout, similar to those of the galeated species, but jagged or dentated along the whole of their back part. The emeu is swifter in running than the fleetest gray-hound. It has not yet been found anywhere but in Australia. The flesh has a considerable resemblance to beef. The young of the New Holland cassowary are striped with white and brown.

CAST, in the fine arts, is an impression taken by means of wax or plaster of Paris from a statue, bust, bass-relief, or any other model, animate or inanimate. In taking a cast from a living person's face, it is necessary, first, to anoint the eye-brows and eye-lashes, and any hairs about the cheeks and temples, with a little sweet-oil; then to insert two tubes (oiled also) of pasteboard into the nostrils, so that breathing may be performed through them; a handkerchief is then to be tied loosely over the face, and the head sloped backwards in an elbow chair or sofa. Powdered and calcined plaster of Paris is then mixed with spring water to the consistence of cream, and poured in between the face and handkerchief to the depth of half an inch. On becoming fixed or hard, it is removed and left to dry. When dried thoroughly it is well soaked with linseed-oil, and an impression may then be taken from it, in plaster of Paris or soft clay; the hollow cast being first split longitudinally down the nose, so that the object cast may be more easily removed. See MODEL and SCULPTURE.

It ought to be observed that all models should be divided into several pieces or joints; thus, in that covering any round body, one side must be covered first with the plaster, and the sides pared with a knife, and smeared with clay and water, then the remaining part of the object covered with plaster, and a joint will thus be formed between the two parts; for, wherever the mixture of clay and water has been applied with a hair brush, the cast will not adhere, and therefore will be easily separated with the blunt edge of a knife. It is usual also to make small pits or depressions of the size of small buttons, on the edges of the joints of moulds, so that they may lock together well when added, and thus fit closely.

Plaster casts are varnished by a mixture of soap and white wax in boiling water. A quarter of an ounce of soap is dissolved in a pint of water, and an equal quantity of wax afterwards incorporated. The cast is dipped in this liquid, and after drying a week is polished by rubbing with soft linen. The surface produced in this manner approaches to the polish of marble. When plaster casts are to be exposed to the weather, their durability is greatly increased by saturating them with linseed-oil, with which wax or rosin may be combined. When intended to resemble bronze, a soap is used made of linseed-oil and soda, coloured by the sulphates of copper and iron. Walls and ceilings are rendered water-proof in the same way.

CAST, or CASTING-LINE, a gut line used in angling, from 2 to 4 yards in length, having artificial flies attached to it at intervals of about 2 feet.

CASTAGNO, ANDREA DEL, an eminent painter, was born at the village of Castagno, in Tuscany, about the end of the fourteenth or beginning of the fifteenth century. Being early deprived of his parents, who were extremely poor, he was employed by his uncle to tend cattle in the fields, and in that situation, by his surprising and untutored essays in the art, attracted the notice of Bernardetto de' Medici, who placed him under the tuition of one of the best masters Florence then afforded. At first he painted only in distemper and fresco, and was in high repute when Domenico Venetiano visited Florence, who had learned from Antonello da Messina the new method of painting in oil and varnish, till then unknown in Tuscany. The splendour of this mode of colouring was much admired, and by a pretended friendship for Domenico, Castagno obtained his secret; but not satisfied with this he desired to be the sole possessor, and determined to murder his friend and benefactor. This he effected without any suspicion, and continued to practise his ill-acquired art with great success. The real author of this atrocious act was never discovered until Andrea made a full confession of his guilt shortly before his death, which happened about 1480. The best of his remaining works are at Florence, in the church of St. Lucia de Magnuoli, and in the monastery Degli Angeli. The latter contains a crucifixion by him painted on a wall.

CASTALIA, a celebrated fountain in Greece, the sacred spring of the Delphic oracle, at which all the pilgrims to Apollo's shrine were obliged to purify themselves. It issues from a fissure between two peaked cliffs, which form the summit of a semicircular range of rocks, anciently called the Phædriades. These immediately adjoin Mount Parnassus, and rise to the height of 2000 feet. The Castalian spring was said to impart poetic inspiration to those who drank of it, but it was only latterly by the Roman poets that it was invested with this attribute. It is now called the Fountain of St. John, from a small chapel dedicated to St. John which stands near its source.

CASTAMBUL. See KASTAMUNI.

CASTANETS, small wooden rattles, made in the shape of two bowls or cups, fitted together and tied by a string, and then fastened to the thumbs. The fingers being rapidly struck upon them, a tremulous sound is produced, which marks exactly the measure of the dance. Something similar to this was the *krotalon* of the ancients, who also made use of small cymbals in their dances and festivals in honour of Bacchus. It is probable, however, that they had their origin in the East, and were brought by the Moors into Spain. Here, too, they received their name *castañuelas*, from being commonly made of the wood of the chestnut (*castaño*), or from their colour. They are still in use in Spain, and here and there in the south of France The charm of variety has also procured for them a place in ballets and operas, as, for example, in John of Paris.

CASTE, a social class whose burdens and privileges are hereditary. The word is from the Portuguese *casta*, race, and was applied by the Portuguese, who became familiar with Hindustan, to the classes in India whose occupations, privileges, and duties are hereditary. This term has been sometimes applied to the hereditary classes in Europe; and we speak of the spirit or the prerogatives and usurpations of a caste, to express particularly that peculiar constitution of society which makes distinction dependent on the accidents of birth or fortune. The division into castes, where it appears in its most typical form, comes to us from a period to which the light of history does not extend; hence its origin cannot be clearly traced: but it is highly probable that wherever it exists it was originally grounded on a difference of descent and in modes of living, and that the separate castes were originally separate races of people. This institution has been found among many nations. According to the accounts collected by Clavigero, some traces of it were apparent among the Peruvians and Mexicans; but it prevails principally in the East, where it has existed from the earliest times, and has become blended with the political condition of the people. The division into castes was entirely interwoven in the whole fabric of civil society, in ancient Egypt and India. In Egypt this division was perfected as a political institution in the flourishing period of the Pharaohs; and the lines of separation which had been drawn in earlier times by a difference of descent and different modes of living were then rendered still more distinct. The number of castes in that country is variously stated by Herodotus, Plato, Diodorus, and Strabo. The institution of caste, however, is best known to us as it exists in Hindustan, where it is well known to have existed since perhaps fifteen hundred or two thousand years before the Christian era. The great Indian castes, as is well known, are four in number, namely, the Brahmans or sacerdotal class; the Kshatriyas or military class; the Vaisyas or mercantile class; and the Sudras or servile class. The three castes first named are regarded as being altogether of a higher character than the fourth, rejoicing in the peculiar religious distinction of being 'twice-born' as contrasted with the 'once-born' Sudras. This distinction is undoubtedly ethnical in its origin, the twice-born castes being descendants of the Aryan invaders and conquerors of the country, while the once-born are the representatives of the conquered. Caste, however, is a much more complicated thing than would be supposed from this brief statement, since the principle of caste classification according to employment as well as to race has long prevailed, and from early times there has been an intricate mingling of castes. The Brahmans are, of course, the sacerdotal caste, but, according to Sir W. W. Hunter (The Indian Empire, 2nd edition, 1893), 'Even among the Brahmans, whose pride of race and continuity of tradition should render them the firmest ethnical unit among the Indian castes, classification by employment and by geographical situation, plays a very important part; and the Brahmans, so far from being a compact unit, are made up of several hundred castes, who cannot intermarry nor eat food cooked by each other. . . . In many parts of India Brahmans may be found earning their livelihood as porters, shepherds, cultivators, potters, and fishermen, side by side with others who would rather starve, and see their wives and little ones die of hunger, than demean themselves to manual labour, or allow food prepared by a man of inferior caste to pass their lips.' Altogether some 1886 separate Brahmanical tribes have been enumerated, and the Kshatriyas or Rajputs now number 590 tribes in different parts of India. 'In many outlying provinces we see non-Aryan chiefs and warlike tribes turn into Aryan Rájputs before our eyes. Well-known legends have been handed down of large bodies of aliens being incorporated from time to time even into the Brahman caste.' While there has been a tendency in the different provinces for every separate employment to develop into a distinct caste, there are also instances of castes changing their employment and raising themselves in the social scale. Thus the Vaisyas, who were anciently that Aryan caste upon whom the tillage of the soil fell, have become the merchants and bankers of India, leaving to the Sudras and mixed castes the labour of cultivation. 'Each caste is to some extent a trade-guild, a mutual assurance society, and a religious sect. As a trade-union it insists on the proper training of the youth of its craft, regulates the wages of its members, deals with trade delinquents, supplies courts of arbitration, and promotes good fellowship by social gatherings. . . . The caste or guild exercises a surveillance over each of its members, from the close of childhood until death. If a man behaves well he will rise to an honoured place in his caste; and the desire for such local distinctions exercises an important influence in the life of a Hindu. But the caste has its punishments as well as its rewards. The fine usually takes the form of a compulsory feast to the male members of the caste. This is the ordinary means of purification or of making amends for breaches of the caste code.' A person who has become an 'out-caste', or lost his caste position and privileges, may generally recover them in this way.

CASTEL-FRANCO, a town of Italy, province of Bologna, 8 miles E. of Modena, supposed to occupy the site of the *Forum Gallorum*, noted for the victory of Hirtius and Pansa over Antony (A.D. 43). Pop. 3000.—Another town of same name is in the province of Treviso, about 24 miles north-west of Venice. It has a cathedral and an old castle, and was the birthplace of the painter Giorgione. Pop. 3800.

CASTEL-JALOUX (ancient *Castrum Gelosium*), a town of France, department Lot-et-Garonne, 28 miles W.N.W. Agen; a neat, well-built place, agreeably situated in one of the oases of the sandy desert of the Landes. The castle, built by the Seigneurs d'Albret, to which the town owes its name, is in ruins. Pop. 3182.

CASTELLAMARE, or CASTELLAMMARE.—1. A seaport town of Italy, in the province of, on the gulf of, and 17 miles S.E. of the city of Naples, at the beginning of the peninsula of Sorrento and 10 miles north-east of that town. It extends for a mile along the shore at the base and on the slope of a spur of Monte Sant' Angelo (4735 feet high), a mountain which commands a splendid prospect. From its pleasant surroundings, shady walks, sea-baths, and other attractions, it is a favourite summer resort of the Neapolitans as well as tourists, and has several good hotels, one of them formerly a royal residence. The harbour is protected by a mole, and there is an arsenal with a dockyard. The town owes its name to a castle built by the Emperor Frederick II. in the thirteenth century. Castellamare occupies the site of the ancient *Stabiæ*, overwhelmed, with Herculaneum and Pompeii, by an eruption of Vesuvius, A.D. 79; and it was here that the elder Pliny met his death by approaching too near to the mountain when in a state of eruption. The modern town was afterwards built from the ruins of Stabiæ. Pop. 33,000. —2. A seaport town in Sicily, called in full CASTELLAMARE DEL GOLFO. It lies in the province of Trapani, and 20 miles to the E. of the town of Trapani, on the gulf of the same name, and exports wine, fruit, grain, oil, sumach, &c. Pop. 13,000.

CASTELLAN, properly the owner or commander of a castle. In Flanders and in France there were formerly certain districts the possessors of which held this title; in Normandy, Dauphiné, and Burgundy there were officers called châtelains who held a rank next after that of bailiffs, and exercised both civil and military authority, although their power was in later times very limited.

CASTELLANETA, a town of south Italy, province Lecce, 18 miles N.W. Tarentum, the seat of a bishopric. Cotton is grown in the vicinity. Pop. 9000.

CASTELLI, BENEDETTO, one of the most celebrated pupils of Galileo, born at Brescia in 1577, was first a monk and then abbot of a Benedictine monastery of the congregation of Monte Cassino. He afterwards became a professor of mathematics, and taught with distinguished success both at the University of Pisa and at the Collegio della Sapienza at Rome. Torricelli was his pupil. He distinguished himself in hydraulics, and rendered important services to Urban VIII. in his projects for the regulation of Italian rivers. He may be regarded as the founder of that branch of hydraulics which relates to the velocity of running water, though his fundamental principle, that the velocity is proportional to the height of the reservoir, is inaccurate, and was demonstrated to be so by Torricelli, who showed that the velocity is proportioned, not to the height, but to the square root of the height. In his investigations as to the measurement of time Castelli made use of the pendulum. He died in 1644. His principal work, entitled Della Misura dell' Acque Correnti, published at Rome in 1628, was translated into French in 1664.

CASTELLO, Gabriel Lancelot, an eminent antiquary, was born at Palermo in 1727, of a noble family, and was placed under a private tutor with a view to study botany, chemistry, &c.; but accidentally meeting with some old coins which had been dug up by a ploughman, he was seized with a great desire to decipher them, and from that time devoted himself to antiquarian pursuits. He formed a splendid collection of the remains of antiquity found in Sicily, and his museum was always open to foreigners as well as to natives. On his death-bed he bequeathed a large quantity of books, &c., to the public library of Palermo. He died in 1794, being at that time an honorary member of the Royal Society and of the Academy at Paris. He published several works.

CASTELLON-DE-LA-PLANA, a town, Spain, capital of the province of Castellon, 40 miles N.N.E. of Valencia. It stands in a large and fertile plain, watered by the Mijares, from which an ample supply of water is brought into the town by an aqueduct supposed to have been constructed by Jayme I. of Arragon, who, in 1233, wrested Castellon from the Moors. It is well built, and has considerable manufactures of sailcloth, and woollen and hempen fabrics, ropes, paper, soap, &c., and some trade in hemp, grain, and fruit. The painters Ribalta, father and son, were born here. Pop. of town (1897), 31,272; of province, 304,477.

CASTELNAUDARY, a town of France, in the department of Aude, on a height above the Canal du Midi, 22 miles W.N.W. of Carcassonne; pop. (1896), 7129. It was built by the Visigoths on the site of a rich town which had been destroyed, and was named *Castellum Novum Arianorum*, from which its present name is corrupted. It rises in the form of an amphitheatre, and was anciently the capital of a district, and strongly fortified. It was the scene of much barbarity by the inquisitors in 1237, was almost totally destroyed by Edward the Black Prince in 1355, and is famous for the battle fought beneath its walls in 1632 between the troops of Louis XIII. and those of Gaston of Orleans, which resulted in favour of Louis chiefly in consequence of the inactivity of the Duke of Orleans. The Duke of Montmorency was wounded in this battle and taken prisoner, and afterwards executed at Toulouse by order of the king, Louis XIII. It is indifferently built, but has manufactures of coarse cloth, several distilleries and tanneries, and one of the largest grain and flour markets in the south of France.

CASTEL-NUOVO, or Novo, a town and commune, Austria, Dalmatia, circle of, and 13 miles W.N.W. Cattaro. It stands near the entrance to the Gulf of Cattaro, and is surrounded by walls which have suffered much from repeated sieges and earthquakes. It contains two churches, a Roman Catholic and a Greek; a lazaretto, and custom-house. The chief manufacture is in articles of brass. The country around is beautiful and fertile. The pop. of the town is small, but that of the commune is 7188, most of whom belong to the Greek Church.

CASTEL-VETRANO, a town, Sicily, in the province and 27 miles S.E. of Trapani, on a rocky hill. It lies in a fertile district, is regularly built, has several churches, grammar-school, with municipal museum, &c. The white wine produced in the neighbourhood is esteemed the best in Sicily. Articles of coral and alabaster are manufactured here. Pop. 20,053.

CASTI, Giambatista, a poet, born in 1721, at Prato, in the vicinity of Florence, studied at Montefiascone, became professor there, was appointed a canon, and made a journey to France. Receiving an invitation from the Prince of Rosenberg, who became acquainted with him in Florence, he went to Vienna, and was presented to Joseph II., who knew how to appreciate the genius of the poet, and delighted in his conversation. Casti took advantage of every opportunity of visiting other courts, and joined several embassies without office or title. Catharine II. received him in the most flattering manner. He visited also the court of Berlin, and several other German courts. After his return to Vienna, Prince Rosenberg, the director of the Imperial Theatre, caused him to be appointed *poeta Cesareo* on the death of Metastasio. After the death of Joseph II. Casti requested his dismission, and retired to Florence, where he wrote many of his works. In 1783 he went to Paris. He died suddenly, Feb. 7, 1803, at the age of eighty-two. His Novelle galanti were republished at Paris, 1804, under the title Novelle di Giamb. Casti, in three vols. They are forty-eight in number. Almost all are of a licentious character, but written in a lively, original, and graceful style. The same may be said of his didactic-satirical poem, Gli Animali parlanti, Poema epico, diviso in twenty-six Canti, di Giamb. Casti (Milan, 1802, five vols.) There are translations of it in French, German, and English. Casti's Rime Anacreontiche are pleasing, and his comic operas La Grotta di Trofonio, and Il Re Teodoro in Venezia, &c., are full of wit and originality.

CASTIGLIONE, Baldassare, one of the most elegant of the older Italian writers; born 1478, at Casatico, in the territory of Mantua; studied at Milan, and entered into the service of the Duke Ludovico Sforza, and afterwards of the Duke of Urbino, of whose elegant and splendid court he soon became an ornament. By him he was sent as an envoy to Henry VII. of England, and afterwards in the same capacity to Louis XII., at Milan. In 1513 Castiglione appeared as ambassador at the court of Leo X., where he became intimate with the most distinguished literati and artists. In 1521 he obtained for the new Duke of Urbino, Federigo, the command of the Papal troops, and in 1524 was employed by Pope Clement VII. to conduct his negotiations with Charles V. When Rome was plundered by the Constable of Bourbon in 1527 he was accused of negligence, and his health was undermined by chagrin. He refused to accept the rich bishopric of Avila, which was offered to him by the emperor, until the pope should be reconciled with Charles. He died Feb. 8, 1529, at Toledo. Among his works the Libro del Cortegiano is the most celebrated. It teaches the art of succeeding at court. His few Italian and Latin poems are elegant. His letters (Padua, 1769-71) are valuable contributions to political and literary history.

CASTIGLIONE, Giovanni Benedetto, a painter born at Genoa in 1616, was a pupil of Paggi, Ferrari, and Antony van Dyck, studied at Rome, Florence, Parma, and Venice, and formed his style on the best masters. He is particularly celebrated as a painter of animals, and in these subjects, as well as his other paintings, is remarkable for softness, elegance, and beauty. Of his larger pieces, the most celebrated are the Creation of the Beasts, their Entrance with Noah into the Ark, and Jacob's Return with his Family and Servants, his Flocks and Herds—all in the Brignole Palace. He also distinguished himself as an engraver, and from his skill in the production of light and shade has been called the second Rembrandt. He died in 1670.

CASTIGLIONE DEL STIVIERE, a small city, Kingdom of Italy, territorial division of Venice, province of Mantua, and 17 miles S.E. of the town of Brescia, 22 miles N.W. of Mantua. It is well built, surrounded by walls, defended by an ancient castle, and contains a large square adorned with a central fountain, three churches, and a town-hall. A well-attended annual fair is held in June. The French obtained here a decisive victory over the Austrians on August 5, 1796, which gave to Marshal Augereau his title of Duc de Castiglione. Pop. 3716.

CASTILE, NEW (Spanish, *Castilla La Nueva*), an ancient province, Spain, corresponding to the old Kingdom of Toledo, and occupying nearly the centre of the peninsula; bounded N. by Old Castile, W. Estremadura, S. Andalusia and Murcia, and E. Valencia and Arragon; greatest length, E. to W., 240 miles; average breadth, about 155 miles; area, 28,010 square miles. It is traversed from E. to W. by three lofty mountain chains, nearly parallel to each other—the mountains of Toledo and Sierra Molina stretching almost across its centre, the Sierra Guadarrama forming its N., and the Sierra Morena forming its S. frontier. Between these chains, which form the great water-sheds of the province, lie two extensive plains or plateaux, with a general inclination to the E.; that to the N. of the central chain belonging to the basin of the Tagus, by which, or its affluents, all its waters are received; and that to the S. belonging to the basin of the Guadiana, except a small portion of the E., which is separated from this basin by a transverse ridge, and sloping S.E., sends its waters to the Mediterranean. These plains, from being very poorly wooded, have in winter a bleak, and in summer often an arid appearance. They are chiefly devoted to the raising of grain, and must, in many districts, be of great fertility, since notwithstanding the miserable system of agriculture pursued, the produce more than equals the consumption. The other principal crops are hemp and saffron. Many of the lower slopes are clothed with vineyards, from which much wine of good quality is obtained. In the higher mountain valleys the pastures are excellent, and feed vast numbers of mules, cattle, sheep, goats, and swine. A mountain product of considerable importance is the *esparto*, of which a variety of articles, and particularly the famous mats so named, are made. The mountains are also rich in minerals, of which it may be sufficient here to mention the quicksilver mines of Almaden, which were long, and probably must still be regarded as the richest in the world. Manufactures, which at one period had attained a high degree of prosperity, are greatly decayed, and the whole province is miserably deficient in regard to all the great branches of industry. The inhabitants have a grave, reflective cast of countenance, and have often distinguished themselves by a peculiar aptitude for scientific acquirement. They are, however, generally indolent in their habits, and live on from day to day as their fathers did before them, seldom attempting to better their condition, and at the same time indulging a self-complacency which to a stranger borders very much on the ridiculous. It must be admitted, on the other hand, that, unlike most people in the world, they are really better than they seem, and possess in a high degree the valuable qualities of civility, generosity, and probity. This ancient province now forms the five provinces of Madrid, Ciudad-Real, Cuenca, Guadalajara, and Toledo. Pop., according to the census of 1897, 1,853,314. For the history of New Castile, see SPAIN.

CASTILE, OLD (Spanish, *Castilla la Vieja*), an ancient province, Spain; bounded N. by the Bay of Biscay, N.E. Biscay and Navarre, E. Arragon, S. New Castile, and W. Leon; greatest length, N.E. to S.W., 210 miles; breadth, 170 miles; area, 25,405 square miles. It is traversed by three mountain chains—the Sierra de Guadarrama, which takes an E.N.E. direction, separating this province from that of New Castile, and on reaching the E. frontier links in with the Sierra de Deza, which turns to the N. and separates Old Castile from Arragon; a central chain, apparently a continuation W. of the Sierra de Deza; and the Cantabrian Mountains in the N., at no great distance from, and almost parallel with, the coast. Numerous minor ramifications penetrate between these chains and diversify the surface, but the greater part of this space consists of extensive, well-watered, and generally fertile plains. The largest of them, to the S. of the central chain, belongs to the basin of the Douro, which, flowing across it E. to W., drains it either directly or by numerous affluents. Even a considerable part of the plains N. of the central chain sends its waters to the Douro. The remaining portion belongs to the basin of the Ebro. Besides these two large basins, a smaller one in the S.E. of the province belongs to the Tagus; and another, equally small, in the province of Santander, and to the N. of the Cantabrian Mountains, sends its waters directly to the sea. The far greater part of the arable land of this province is devoted to the culture of grain, particularly wheat, which is raised in such abundance as to furnish a large surplus for the supply of other provinces, and entitles this one to be regarded as the principal granary of Spain. In addition to cereals the principal crops are flax, hemp, madder, vegetables, and orchard fruits. The vine thrives well, and much excellent wine might be produced; but the inhabitants, either blind to their own interests, or too indolent to pursue them, pay little regard to this most lucrative branch of rural economy, and produce only a little wine of very indifferent quality. The pastures both of the mountains and the plains are excellent. The former are depastured in summer and the latter in winter. In this way an ample supply of food is obtained throughout the year, and immense flocks of merino sheep are fed. The wool thus produced was long famous throughout Europe, and though it is now rivalled by that of Saxony, as well as by that of Australia, the wool of this province still forms one of its principal sources of revenue. Veins of ore and coal strata are found in the mountains, and here and there in the plains salt springs and fields of rock-salt. The export of the products of Old Castile has greatly increased in recent times, owing to the greatly improved communication with Madrid and with the coast, and already the industry and prosperity of the population have been unmistakably and very considerably advanced. Old Castile now forms the provinces of Burgos, Logroño, Santander, Soria, Segovia, Avila, Palencia, and Valladolid. The pop. of Old Castile in 1897 was 1,761,440.

CASTILLEJO, CRISTOVAL DE, a Spanish poet, born at Ciudad-Rodrigo in 1494, was for some time secretary of the Emperor Ferdinand, brother of Charles V., and died a Cistercian monk in the monastery of Val de Iglesias at Toledo. His works possess great originality, and his language is pure and manly, yet sparkling with wit and satire. Some of his writings now appear in a mutilated form, from having been condemned by the inquisitors, and subjected to their pruning. He was the last representative of the old Spanish court poetry, and strenuously opposed Boscan and Garcilaso in introducing the classical Italian forms of literature. In this contest he employed all his weapons of wit and raillery. His poems, which were not collected till after his death, were first published at Madrid in 1573, and were afterwards included in the collection of Ramon Fernandez. The date of his death is unknown.

CASTING, the running of melted metal into a mould, so as to produce an object in metal having the shape of the mould. Iron-casting or iron-founding is carried on by three methods, the first called *open sand-casting*, the second, *sand-casting between flasks*, and the third *loam-casting*. In most of these an exact pattern, usually of wood, is employed by the founder. The floor of every foundry is composed, for several feet deep, of a loamy sand, in which deep pits may be sunk to bury large moulds. This floor must be kept exceedingly dry, and free from any wet or moisture, otherwise the melted matter, converting the watery particles into vapour, would blow up the building and destroy the workmen. In the place where the mould is to be made a layer of sand is lightly sprinkled through a sieve on the floor, and the wooden pattern pressed firmly down into it, level with the surface. The sand is then to be shovelled up all around, level with the top of the pattern, and rammed down with a tool. A moist sponge is then used for slightly wetting the sand all round the edges of the pattern, to make its particles adhere together. The next operation is lifting the pattern out of the sand, by one or more screws, screwed into the wood. If the pattern is small, this can be easily done by one or more men; but in very large works it is effected by a crane. The workman then uses a pair of bellows for blowing away any small pieces of sand which may have fallen into the mould, and then sifts some finely powdered charcoal over its surface. It is now ready for filling with metal. In small works this is done by ladles and in large by small channels made in the sand, leading from the mould to the mouth of the furnace. When the mould is filled, the hot metal is covered with sand to keep the air from it while it is cooling.

Sand-casting between flasks is used for more complex articles than the former; such, for instance, as if they were cut into two or more pieces (provided the cutting planes were parallel to each other), each separate piece might be cast in open sand. The flasks are iron frames furnished with four handles, by which they may be lifted, and having iron points fitting into holes prepared in the other flask for joining them accurately together. The under flask being placed upon a board, filled with sand, and the sand rammed tight into it, the workman then takes the pattern and presses one-half of it into the sand, and smooths the sand up to the sides of it with a trowel; he then sets the empty flask over the other, adjusting its points to the holes, and after sprinkling some sand which has been burned (to free it from moisture) over the sand in the under flask, he fills the upper one with sand, and rams it down; he next, with a piece of wood, put through the sand in the upper flask, makes a hole to pour the metal through. The upper flask, with the sand in it, is then raised off by men by the handles, or in large works by a crane, and the pattern lifted out. The flask is then put on again, and heavy weights laid upon it to keep it down ready for casting. It must be observed that at every uppermost point of large moulds a small hole must be bored through the sand in the upper flask, to allow the rarefied air to escape out of the mould when melted metal is poured in. To save expense it is now customary to make flasks of any size that may be wanted out of rectangular iron plates, which are fitted together by means of screws and bolts. This obviates the necessity of keeping a large store of flasks of different sizes, and enables the caster to adapt the form of the flask to that of the model for which it is intended.

Loam-casting is used for bulky, hollow articles, such as cylinders, large pipes, cauldrons, boilers, &c., and is conducted in this manner:—If, for instance, a large cylinder is to be cast, a mould has first to be made as follows: To a beam in the roof of the foundry is affixed a perpendicular spindle, with three or four holes through it to fix an iron arm in, at different heights, by means of a nut. This arm has two bars placed at such a distance as to be capable of receiving a wooden plank, which can be firmly secured to them by means of two clamps. The operation is then begun by laying an iron ring upon the ground, and adjusting it so as to be concentric to the spindle. A cylinder of brick-bats, or clay and wet loam (instead of mortar), is then to be built upon it, some inches less in diameter than the intended cylinder, for which this is to form a core; the brick-bats are then to be firmly bound together with iron hoops, annealed wire, &c., and a fire is then to be lighted within the erection to dry it. When the loam used between the bricks is dry, a coating of loam is spread over the whole, and is perfectly smoothed by causing the edge of the perpendicular board to revolve round it. This coat makes it of the proper size for the inside of the cylinder to be cast, and is called the core of the mould. Another cylinder is built, plastered, and smoothed in the same way (except that no hoops are used), whose diameter is the same as the outside of the cylinder to be cast. When this is finished it is covered with a coating of charcoal, ground up with water like paint, laid on with a brush, and a thin coating of loam is laid on; this is bound round with hoops, and to these four hooks are fixed to lift it by; a thick coat of loam and hair is then laid over it. When all these are dry a man then gets down into the cylinder, and with a small pick pulls down all the bricks in the inside cylinder, and then with a trowel cuts away all the loam, leaving the inside of the external cylinder (which is called the mould) quite smooth. This is effected by the coating of powdered charcoal, which prevents the two coats of loam from adhering together. A deep pit is now dug in some convenient part of the foundry, into which the core is let down by a crane. The core being placed in the pit, the mould is let down after it by the same means; and when they are adjusted, the sand is thrown and rammed round about half the height; a flat cover of dried loam is then put on the top of the mould and core, and round pieces of wood are put in the holes which had before been made in the cover for pouring the metal in at. The burying of the mould is then completed. When it is all levelled, the sticks which keep open the holes for the metal are carefully withdrawn, and small channels made from the furnace to allow the melted iron to find its way to the mould. When the form is more complicated, as in pear-like shapes, &c., where a man cannot be introduced to pick out the bricks, the mould must be sawn in two perpendicularly, with a fine saw, to get it off. It is then put together again round the core, and the crack plastered up with loam.

CAST IRON is the name given to the iron obtained from the blast-furnace by running the fused metal into moulds prepared for the purpose. The moulds are in the form of long narrow channels, from which the iron, when it has cooled and solidified, is taken in bars called *pigs*, between 3 and 4 feet long, and 3 or 4 inches broad. See IRON.

CASTLE, a word derived from the Latin *castellum*, a diminutive of *castrum*, a fortress or stronghold. The word *castellum* was frequently applied by the Romans as a military term to denote a redoubt. In feudal times the word came to be used as the designation of those strongholds which served at once as residences and as places of defence for the nobles, and which continued to exist until the invention of gunpowder changed the whole system of fortification. It is probable that not only the name but the thing also was derived from the Romans, for the Roman fortresses, erected in the territories conquered by them, seem to have furnished the model in which the feudal castles were built. The royal residences among the Franks resembled in some points both the Roman villa and the Roman camp, and those of the Frankish nobles differed little from those of the kings, except in point of simplicity. Strictly speaking, only the grand feudatories had the right to erect fortified castles, and then only after receiving the royal consent; but the grand feudatories very early began to take it upon themselves to grant the privilege of erecting castles to their vassals, and these again to those of a still lower grade. In this way large numbers of castles began to spring up at an early period in France, Germany, England, and elsewhere. The following description of the castles of England, as they were built at two different periods, the Norman period and that of Edward III. and his immediate successors, may serve to give an idea of feudal castles generally:—The first defence of a castle was the moat or ditch, that sometimes comprised several acres; and behind it was the outer wall, generally of great height and thickness, strengthened with towers at regular distances, and pierced with loop-holes through which missiles could be discharged at the assailants. Within these defences were three divisions, consisting of the *outer ballium* or lower court, the *inner ballium* or upper court, and the *keep;* while the main entrance through the outer wall was protected by the *barbican*, with its narrow archway, and strong gates and *portcullis.* It was no wonder that with such a net-work of walls, division of courts, and multiplied means for the defenders both of safety and annoyance, the dislodgment of an obnoxious magnate should have been so hard a task even when the royal banner marched against him. While so much was done for security and resistance, nothing was left for domestic comfort but the keep, which formed the residence of the baron and his family. This was the innermost of all the buildings, to which the defenders retreated only in the last extremity, and was so strongly constructed, that in the ruins of castles it generally survives as a recording monument of departed greatness. A domicile erected on such a principle must, according to our modern ideas, have been sufficiently comfortless where every window was a shot-hole, and every apartment a battery, and where light could not be admitted without also inviting an enemy. But such as it was, it was the constant home of lordly knights and high-born dames; and, therefore, their taste and ingenuity as well as their resources were employed to make the most of it.

The castles erected at a somewhat later period, during the reign of Edward III. and some of the succeeding kings of England, exhibit a remarkable union of picturesque beauty with solidity and strength. The masonry is of the most careful and finished description, but the buildings are not overloaded with ornament, the architects trusting more to the outline of their masses than to lesser decorations. Of this the round tower of Windsor Castle is a well-known example. It is quite plain in its details, but its immense size and its bold outline gives a character to the mass of discordant materials, ancient and modern, of which the castle is composed, and at a distance unites them into one picturesque whole. Without the round tower of William of Wykeham, Windsor Castle would be a meaningless collection of unconnected objects. The same boldness of ideas prevailed throughout; and military as well as ecclesiastical architecture seems to have attained its greatest perfection at this time.

The Edwardian castles differ from the early Norman in many important particulars; the solid keep becomes developed into an open quadrangle, defended at the sides and angles by gatehouses and towers, and containing the hall and state apartments ranged along one side of the court. The term keep is no longer applicable, and around this inner ward or bailey two or three lines of defence are disposed concentrically. Such castles frequently inclose many acres, and present an imposing appearance. The parts of a perfect Edwardian castle are—the *inner bailey;* the *walls of the enceinte*, single, double, or triple; the *middle* and *outer baileys*, contained between the walls; the *gatehouses* and *posterns*, or small doors in the wall; and the *ditch*, which was usually filled with water. The inner bailey contained the hall, often of great size, the chapel, the better class of apartments, and an open court. The offices usually were placed in the middle bailey, on the outside of the wall of the hall. The outer bailey contained stabling, sometimes a mill, &c., and often a mound of earth, or *cavalier*, to carry a large engine. The walls were strengthened by towers, either circular, square, oblong, or multangular, projecting both outwards and inwards. Such towers were all capable of being defended independently of the castle, and usually opened into the court and upon the walls by portals, regularly defended by gates and a portcullis. The gatehouses are distinct works, covering the entrance; they contain gates, one or two portcullises, holes for stockades of timber, and loop-holes, raking the passage. Overhanging the arch at either end are funnels for pouring down boiling liquids upon assailants, and above are ovens and flues for heating them; and from the front of these gatehouses the drawbridge was lowered over the ditch. These gateways had frequently a barbican attached. This was a passage between high walls, in advance of the main gate, and having an outer gate of entrance, which was defended by towers and the parapet connected with the main gateway. The gates or *bars* of York have had barbicans, but they are all destroyed except Walmgate. There is a very perfect specimen at Alnwick, and another at Warwick, where the portcullis is still in use. The top of the wall was defended by a battlemented parapet, the opening of which sometimes bears stone figures, as on the bars of York, and as at Alnwick and Chepstow. These battlements are frequently pierced by cruciform loop-holes or *balistraria.* In many cases a bold corbel table is thrown out from the wall, and the parapet placed upon it, so as to leave an open space between the back of the parapet and the face of the wall. The space is divided by the corbels into holes called *machicolations*, which overlook the outside of the walls. If the parapet be not advanced by more than its own thickness, of course no hole is formed; this is called a *false machicolation:* it is used to give breadth to the top of the wall, and is common to all periods. One of the finest examples of a tower of this period is Guy's Tower at Warwick. It is in an almost perfect state, from the dungeon in the rock to the top of the parapet. Its plan is composed of three segments of circles on the outer, and a flat face on the inner side; its different stories are vaulted, and retain their original arrangement, and its machicolations are bold and perfect. Clifford's Tower, York, is another fine example, and offers a beautiful specimen of the masonry of the time.

CASTLEBAR, a town, Ireland, capital of county Mayo, at the N. extremity of a lake of same name; pop. in 1891, 3558. It has an elegant Episcopalian church, with a fine tower, a Roman Catholic church, lunatic asylum, barracks, &c. The trade (carried on at weekly fairs) is chiefly in cattle, pigs, and agricultural produce. It was taken by the French force which landed at Killala Bay in 1798, but evacuated shortly after on the approach of Lord Cornwallis.

CASTLEMAINE, a municipal town in the colony of Victoria, in the county of Talbot, at the junction of Barker and Forest creeks, 78 miles north-west of Melbourne, on the Melbourne and Echuca Railway, with branch communication by Maryborough with Ballarat. The town is pleasantly situated and well laid out, and the buildings, both public and private, are of a superior character. The principal public buildings are the town-hall, the hospital, the supreme court, and the mechanics' institute. Castlemaine owes its importance to the mining industry carried on in its neighbourhood. Pop. (1891), 6082.

CASTLEREAGH, a barony in the county of Down, Ireland. The castle stands on the summit of a Danish rath, and was once the seat of an O'Neil. It is now the property of the Marquis of Downshire. The barony gives the title of viscount to the Marquis of Londonderry.

CASTLEREAGH, LORD. See LONDONDERRY.

CASTLETON, a village in England, in the county of Derby, situated at the bottom of a rugged eminence, on which stands the ancient castle called Peak Castle, erected by William Peveril, natural son of the Conqueror. The houses are chiefly of stone. It contains the parish church, a fine specimen of the early pointed style; two Methodist chapels, and a free grammar-school. The inhabitants are mostly employed in mining; but many derive a subsistence from the manufacture of ornamental articles from spar. See PEAK. Pop. 500.

CASTOR AND POLLUX (the latter called by the Greeks POLYDEUCES), the sons of Tyndareus, king of Lacedæmon and Leda, or, according to some, of Zeus and Leda. The fable runs that Leda brought forth two eggs, one of which contained Pollux and Helen, the other Castor and Clytæmnestra. Pollux and Helen, being the offspring of Zeus, were immortal; but Castor and Clytæmnestra were begotten by Tyndareus, and mortal. Homer's account is that both Castor and Pollux were the sons of Tyndareus, and that Helen was the daughter of Zeus. The two brothers were inseparable companions, equally brave and spirited, and attached to each other with the fondest affection. Castor was particularly skilled in the art of breaking horses, and Pollux in boxing and wrestling. They were among the heroes of the Argonautic expedition, in which they acquired divine honours; for a terrible tempest having arisen on the voyage, and all with loud voices calling on the gods to save them, there suddenly appeared over the heads of Castor and Pollux two star-like meteors, and the tempest subsided. From this time they were the patron deities of mariners, and received the name of *Dioscuri* (that is, 'sons of Zeus'); and from them the name of *Castor and Pollux* was given to the fires that are often seen on vessels' masts in storms, and which are electrical phenomena. After their return they released their sister Helen from the confinement in which Theseus had for some time held her. They were also among the heroes of the Calydonian hunt. They wooed the daughters of Leucippus, Phœbe and Hilaeira or Elaeira, and carried them off and married them. Having become involved in a quarrel with Idas and Lynceus, the sons of Aphareus, Castor killed Lynceus, and was slain by Idas. Pollux revenged his brother's death by killing Idas, but full of grief for the loss of Castor, he besought Zeus either to take away his life or grant that his brother might share his immortality. Zeus listened to his request, and Pollux and his brother alternately resided one day on earth and the other in the heavenly abodes of the gods. It is doubtful whether the ancients understood them as being together or separate in their alternate passage between the upper and the lower worlds. The former opinion seems to be the oldest; the latter to have gained ground subsequently. Temples and altars were consecrated to them. In great perils, especially in battles, the ancients believed that they frequently appeared to mortals as two youths on white steeds, in shining garments, with meteors over their heads; and then they were chiefly called *Dioscuri*. They were also represented side by side, either riding or standing, each holding a horse by the rein, with spears in their hands and stars on their heads.—In the heavens the Dioscuri appear as one of the twelve constellations of the zodiac, with the name of *Gemini* (the Twins).

CASTOR AND POLLUX are two minerals which are found together in granite in the island of Elba. Castor is a silicate of aluminium and lithium, and is probably a variety of petalite (which see). It is colourless and transparent, with a glistening lustre; it fuses with difficulty before the blowpipe flame, to which it imparts a crimson tint. Pollux is a silicate of aluminium and the rare element cæsium (which see), of the oxide of which it contains 34 per cent. Notwithstanding this large quantity, it escaped detection in earlier analyses, and the mineral was described as a silicate of aluminium, sodium, and potassium, though it does not contain any of this last. The mistake arose from ignorance of the existence of cæsium, and from the remarkable similarity between the compounds of that metal and those of potassium. It is colourless and transparent, with a vitreous lustre, and somewhat resembles quartz. It is difficultly fusible before the blowpipe; and is decomposed by hydrochloric acid.

CASTOR-OIL. The castor-oil plant (*Ricinus communis* or *palma Christi*) is a native both of the East and West Indies, and has a stem from 5 to 15 or 16 feet in height, and large bluish-green leaves, divided into seven lobes, serrated and pointed, with long footstalks. The flowers are produced in a terminating spike, and the seed-vessels are covered with spines, and contain three flattish oblong seeds.—The plant belongs to the sub-order Crotoneæ, of natural order Euphorbiaceæ. It is to the seeds of this plant that we are indebted for the drug called *castor-oil*. It is now often prepared by pressing the seeds in the same way as is practised with oil of almonds. The oil thus obtained is called *cold drawn*. But the mode chiefly adopted in the West Indies is first to strip the seeds of their husks or pods, and then to bruise them in mortars. Afterwards they are tied in linen bags and boiled in water until the oil which they contain rises to the surface. This is carefully skimmed off, strained, to free it from any accidental impurities, and bottled for use. The oil which is obtained by boiling is considered more mild than that procured by pressure, but it sooner becomes rancid. The mildest and finest Jamaica castor-oil is very limpid, nearly colourless, and has scarcely more smell or taste than good olive-oil. The oil is produced abundantly in India and America, as well as the West Indies. Its utility as a medicine has been known from ancient times.

CASTRAMETATION, the art of tracing out and disposing to advantage the several parts of a camp on the ground. See CAMP.

CASTRATES. The change produced in men by emasculation is highly remarkable, and assimilates their constitution, in some respects, to that of females. The elasticity of the fibres and muscles is weakened, and the cellular membrane becomes charged with a much larger quantity of fat; the growth of the beard is prevented; the upper part of the windpipe contracts considerably, and the castrate acquires the physiognomy and voice of a female. On the moral character it likewise appears to have some influence by weakening the intellectual faculties and rendering the subject unfeeling, morose, faint-hearted, and on the whole incapable of performing those deeds which require a high, magnanimous disposition. The most numerous class of castrates are those who are made such by the removal of the testicles. Another class are not deprived of the parts of generation, but have them ingeniously injured in such a manner as to leave them the faculty of copulating, but deprive them of the power of begetting. Juvenal mentions these as the particular favourites of the licentious Roman ladies. To the third class belong those who are entirely deprived of their genital members. They are used in preference, by the Turks, as keepers of their women. The castrates of all three classes are called *eunuchs*. Those of the third class, to distinguish them from the two others, are frequently termed *entire eunuchs*. The word *eunuch* is Greek, and signifies *guard* or *keeper of the bed*. The castration of adults produces some change in the disposition, but little in the bodily constitution. Even the power of engendering continues for a short time. According to the accounts of ancient historians, the Lydians, celebrated for effeminacy, castrated women. The latter are said to have used these beings as guards of their wives and daughters. With females the operation produces a completely opposite effect to that which it has on men. The sexual appetite ceases, a beard appears on the chin and upper lip, the breasts vanish, the voice becomes harsh, &c. Boerhaave and Pott relate modern instances of this kind. Nothing but an immediate and fatal injury to the parts authorizes an operation of such vital consequence to the human race. Among the evils which religious fanaticism has at all times produced, castration is conspicuous. The Emperors Constantine and Justinian were obliged to use their utmost power to oppose this religious frenzy, and could put a stop to it only by punishing it like murder. The Valerians, a religious sect whose minds had been distracted by the example of Origen, not only considered this mutilation of themselves as a duty which religion imposed on them, but believed themselves bound to perform the same, by fair means or foul, on all those who came into their power. In Italy the castration of boys, in order to form them for soprano singers, was in use for a long time, *evirati* having been employed in the pontifical chapel ever since the beginning of the seventeenth century, to sing the treble parts. Clement XIV. prohibited this abuse, which, notwithstanding, did not cease till comparatively recent times, and in some Italian towns was not only suffered, but exercised with such shameful openness that the practitioners gave public notice of their profession. In modern times severe laws were enacted against castration, and the custom is probably now extinct. Beings thus mutilated were common on the European stage and in R. Catholic churches. Among the Papal singers they were to be found up to 1823 at least. It is remarkable that so odious and unnatural an operation should produce the fine effect on the tones of the singer, which all had to acknowledge notwithstanding the disagreeable effect of the association. In the R. Catholic Church no castrate, however he became such, is permitted to be an officiating priest. Castration is also in many cases practised on domestic animals (as oxen, horses, and poultry) with the object of moderating their impetuosity, rendering them more submissive and docile, more adapted to the nature of the work they are intended for, or of increasing their size or facilitating the accumulation of fat.

CASTRÉN, Matthias Alexander, a celebrated philologer, and the most distinguished student of the Finnish races and languages, was born in 1813 at a place to the N. of Torneå, in Finland, not far from the boundary between the latter country and Lapland. While attending as a young man the University of Helsingfors he conceived the project of tracing out the various detached branches of the Finnish races and languages, and presenting their ethnological and philological phenomena in one general view. Following out this idea he undertook in 1838 a pedestrian excursion through Finnish Lapland, and another in 1840 through the district of Karelia, with the view of studying the primitive language of that country, and enabling himself to translate therefrom into Swedish the great Finnish epic of the Kalevala. This last work was accomplished by him after his return. He soon, however, resumed his travels, and for several years continued to prosecute his researches among the nations of the Arctic regions, both in Europe and Asia, including the Norwegian and Russian Lapps, and the Samoyeds of Siberia and the coasts of the White Sea. Naturally of a weakly constitution and in a failing state of health, he was frequently obliged, in addition, to submit in the course of his journeys to the most extreme privations. Having returned home from his last journey to the Samoyeds he was appointed in 1851 professor of the Finnish and old Scandinavian languages in the University of Helsingfors, but his exhausted frame was unable much longer to support its tenant. He died a martyr to science on 7th May, 1852. Among his works are his translation of the Kalevala already mentioned; an Ostjak Grammar in German, published at St. Petersburg in 1849; Elementa Grammatices Syrjænæ (Helsingfors, 1844); Elementa Grammatices Tscheremissæ (Kuopia, 1845); and De Affixis Personalibus Linguarum Altaicarum (Helsingfors, 1850), besides travels and other works published after his death.

CASTRES (ancient *Castrum Albiensium*), a town, France, department of Tarn, 23 miles S.S.E. of Albi, on the Agout, which divides it into two parts—Castres Proper, N. side, and Villegoudon, S. side of the river, which is crossed by two stone bridges. The streets are narrow and winding. The public buildings are the hôtel de ville, formerly the episcopal palace, which contains a public library, and has a garden laid out on the plan of the Tuileries; three churches, one of them Protestant; two hospitals, a theatre, cavalry barracks, &c. There are several fine promenades, and a handsome square. The manufactures of the town are in a thriving condition. They consist of fine cloths, coarse cloth for the troops, flannels, blankets, and other woollen goods, linen, glue, and black soap. There are also bleaching-grounds, dye-works, tanneries, paper-mills, forges, and brass-foundries. A considerable trade is carried on in the above articles, and in silk, cotton, liqueurs, and confectionery. Castres has a communal college and two seminaries. The bishopric of which this was once the seat was suppressed at the revolution. The town of Castres arose round an abbey of the Benedictines (which is said to have been founded in the ninth century), and was already in the twelfth century a place of importance in the district of Albigeois, the lords of which were abbots of the monastery. During the Albigensian war Simon de Montfort was its lord. In 1519 it was united to the crown of France. During the religious wars this town, as an adherent of Calvinism, was often the theatre of war. Louis XIII., to whom the town surrendered in 1629, ordered its fortifications to be razed to the ground. Rapin the historian and A. Dacier the philologist were natives of Castres. Pop. (1896), 19,595.

CASTRIES, Charles Eugène Gabriel de la Croix, Marquis of, born in France in 1727, entered the army, fought at Dettingen and in Lower Alsace, became lieutenant of Languedoc and governor of Montpellier and Cette, and under Marshal Saxe commanded the army in Flanders, where he covered the sieges of Menin, Ypres, and Courtray, and ended the campaign with the battle of Courtray. He afterwards fought at Fontenoy, Raocoux, and Laufeld. During the Seven Years' war he added greatly to his fame, was made lieutenant-general, and was dangerously wounded in the battle of Rossbach. In 1783 he was Marshal of France, and emigrating in 1791 found an asylum with the Duke of Brunswick. He subsequently commanded the army of the French princes in Champagne, and countersigned the manifesto issued by Monsieur in 1793. In 1797 he formed, in conjunction with St. Priest, the so-called cabinet of Louis XVIII. at Blankenburg, and died at Wolfenbüttel in 1801.

CASTRO, Ines de. Pedro, son of Alphonso IV., king of Portugal, after the death of his wife Constantia (1345), secretly married his mistress, Ines de Castro, who was descended from the royal line of Castile, from which Pedro was also descended on his mother's side. As he steadily rejected all propositions for a new marriage, his secret was suspected, and the envious rivals of the beautiful Ines were fearful that her brothers and family would gain a complete ascendency over the future king. The old king was easily blinded by the intrigues of his artful counsellors, Diego Lopez Pacheco, Pedro Coelho, and Alvarez Gonsalvez. They persuaded him that this marriage would be prejudicial to the interests of his young grandson Ferdinand (the son of Pedro by his deceased wife). Alphonso asked his son if he was married to Ines. Pedro dared not confess the truth to his father, much less would he comply with the command of the king to renounce his mistress and unite himself to another. Alphonso again consulted his favourites, and it was resolved to put the unhappy Ines to death. The Queen Beatrice, mother of the infant, obtained intelligence of this cruel design, and gave her son notice of it. But Pedro neglected not only this information, but even the warning of the Archbishop of Braga, as a rumour intended merely to terrify him. The first time that Pedro left Ines, to be absent several days on a hunting expedition, the king hastened to Coimbra, where she was living in the convent of St. Clara with her children. The arrival of Alphonso filled the unhappy lady with terror; but, suppressing her feelings, she appeared before the king, threw herself with her children at his feet, and begged for mercy with tears. Alphonso, softened by this sight, had not the heart to perpetrate the intended crime. But after he had retired his evil counsellors succeeded in obliterating the impression which had been made on him, and obtained from him permission to commit the murder which had been resolved on. It was executed that very hour; Ines expired under the daggers of her enemies. She was buried in the convent where she was murdered (1355). Pedro, frantic with grief and rage, took arms against his father, but the queen and the Archbishop of Braga succeeded in reconciling the father and son. Pedro obtained many privileges, in return for which he promised on oath not to take vengeance on the murderers. Two years after King Alphonso died; the three assassins had already left the kingdom, by his advice, and taken refuge in Castile, where Peter the Cruel then reigned, whose tyranny had driven some noble Castilians into Portugal. Pedro agreed to exchange these fugitives for the murderers of Ines. Having delivered them to their master, he received in return the persons of Pedro Coelho and Alvarez Gonsalvez; the third, Pacheco, escaped to Arragon. The two were then tortured in the presence of the king in order to make them disclose their accomplices; their hearts were torn out, their bodies burned, and their ashes scattered to the winds (1360). Two years after he assembled the chief men of the kingdom at Cataneda, and solemnly declared on oath that after the death of his wife Constantia he had obtained the consent of the pope to his union with Ines de Castro, and that he had been married to her in the presence of the Archbishop of Guarda and of an officer of his court, Stephen Lobato. He then went to Coimbra. The archbishop and Lobato confirmed the assertions of the king; and the Papal document to which the king referred was publicly exhibited. The king caused the body of his beloved Ines to be disinterred, and placed on a throne, adorned with the diadem and royal robes, and required all the nobility of the kingdom to approach and kiss the hem of her garment, rendering her when dead that homage which she had not received in her life. The body was then carried in a funeral car to Alcobaça. The king, the bishops, the nobles, and knights of the kingdom followed the carriage on foot; and the whole distance, from Coimbra to Alcobaça, was lined on both sides by many thousands of people bearing burning torches. In Alcobaça a splendid monument of white marble was erected, on which was placed her statue, with a royal crown on her head. The history of the unhappy Ines has furnished many poets of different nations with materials for tragedies—Lamothe, Count von Soden, &c.; but the Portuguese muse has immortalized her through the lips of Camoens, in whose celebrated Lusiad the history of her love is one of the finest episodes.

CASTRO-DEL-RIO, a town, Spain, Andalusia, in the province and 16 miles S.E. of Cordova, on a declivity, right bank of the Guadajoz. The more ancient part of the town is surrounded by a dilapidated wall, flanked with towers, and entered by one gate, which was defended by an Arab castle, now also ruinous. The modern portion is outside the walls, and extends along the foot of the hill on its N. side. Most of the streets are wide and regular, lined with well-built houses and handsome public edifices. The church is large and handsome, and there are also several convents, two colleges, primary schools, hospitals, and manufactures of linen, woollen, and earthenware. Pop (1887), 11,286.

CASTRO-GIOVANNI (ancient *Enna*), a town, Sicily, province of Caltanissetta, 13 miles N.N.W. of Piazza, near the centre of the island, on a high tableland formed by the union of the three chains of mountains extending in different directions from this point. Its height above sea-level is more than 4000 feet. The plateau on which it stands is still remarkable for fertility; while in ancient times it was adorned with the groves and temples of Ceres (Demeter), the presiding goddess of the locality, who is said to have been a native of Enna. It was here, according to the common story, that Prosperine (Persephone), the daughter of Ceres, was carried off by Pluto. An old castle still remains, probably built by the Northmen, who occupied Sicily in the middle ages. Castro-Giovanni is miserably poor, and appears to be going still further to decay. Sulphur is obtained in the district to the annual amount of nearly 50,000 cwts. Pop. 14,084.

CASTRUM DOLORIS, a Latin term signifying *castle of grief*, has a different meaning from *catafalco*. The latter is used to denote an elevated tomb, containing the coffin of a distinguished person, together with the tapers around, ornaments, armorial bearings, inscriptions, &c., placed in the midst of a church or hall. The *castrum doloris* is the whole room in which the *catafalco* is elevated, with all the decorations. The sarcophagus, usually empty, is exposed for show upon an elevation covered with black cloth, under a canopy surrounded with *candelabra*. Upon the coffin is laid some mark of the rank of the deceased, as his epaulette or sword, and, when the deceased was a sovereign or a member of a ruling family, princely insignia are placed on surrounding seats. The French call the *castrum doloris*, *chapelle ardente*, sometimes also *chambre ardente;* but the latter has also a separate meaning. See CHAMBRE ARDENTE.

CASTUERA, a town, Spain, Estremadura, province of and 67 miles E. by S. Badajoz, near the right bank of the Guadalefra. Most of its streets are straight, clean, and well paved. It has two squares, lined with substantial houses; the principal one contains the town-hall, prisons, and spacious modern parish church. Here are also several chapels, three schools, and an extensive cemetery. The inhabitants are engaged in weaving, making earthenware, tiles, bricks, shoes, &c. Trade is carried on in cattle, wool, wine, grain, and oil. Pop. (1887), 7133.

CASUISTRY, that part of the old theology and morals which relates to the principles by which difficult cases of conscience (especially where there is a collision of different duties) are to be settled. Kant calls it the *dialectics of conscience.* Hence a casuist is a moralist who endeavours to solve such doubtful question. There have been many celebrated casuists among the Jesuits—for example, Escobar, Sanchez, Busembaum, &c.—famous for their ingenuity in the invention of such cases, and for the ambiguity and singularity of their solutions. It is impossible, without reading the works of some of the casuistical writers, to form an idea of the ingenious and fine-spun sophistry which they contain.

CAT (*Felis catus*, L.), a well-known domesticated quadruped belonging to the order Carnivora (which see). According to the character most commonly attributed to the cat, though capable of showing considerable fondness for an individual, she never appears to confide fully even in the warmest demonstrations of kindness, and her attachment is rather to the dwellings than the persons of her protectors. In this respect her conduct is contrasted very unfavourably with that of the dog, whose alliance with man is founded upon disinterested personal attachment, not to be affected by changes of place or fortune. Her youthful sportiveness, beautiful fur, and gentle demureness of manner in after-life, dispose mankind to regard the animal with kindness; but in a great many cases the attempt to cultivate her good qualities is said to be followed with slight success, and to meet with much deceit and ingratitude. Her treacherous calmness of disposition needs, we are told, but slight provocation to be changed to vengeful malignity. When hurt or much alarmed she is ready to attack her best benefactor with as much fury as a stranger. Being highly sensitive and fond of ease, the cat evinces little anxiety except for the continuance of her enjoyment, and is ever prepared to seek more comfortable quarters whenever the condition of her patrons may render a movement politic. This character, however, is believed by a great many (including the present writer) to be far too severe; and those who have had the widest and most intimate acquaintance with cats maintain that they are by no means the selfish and treacherous animals that they are commonly represented to be. The Rev. J. G. Wood, a high authority on all matters relating to domestic pets, writes as follows:—'Whatever may have been the experience of those who gave so slanderous a character to the cat, my own rather wide acquaintance with this animal has led me to very different conclusions. The cats with which I have been most familiar have been as docile, tractable, and good-tempered as any dog could be, and displayed an amount of intellectual power which would be equalled by very few dogs and surpassed by none. With regard to the comparatively good and bad temper of the cat and dog, there is as much to be said in favour of the former as of the latter animal; while as to their mental capacities the scale certainly does not preponderate so decidedly on the side of the dog as is generally imagined. Nor is my own experience a solitary one, for in almost every instance where my friends have possessed favourite cats, the result has been the same.' At what period cats became inmates of human habitations it is scarcely possible at this period to determine. Beyond doubt their usefulness in destroying rats, mice, and other small animals first introduced them to notice. The first mention we find made of them in profane history is by Herodotus, the father of historians, in his account of Egypt (lib. ii.); and they are mentioned, according to Mr. Blyth, in Sanskrit writings 2000 years old. Herodotus speaks of them as diminishing the vermin infesting human dwellings; states some of the Egyptian superstitions relative to them, as well as some observations upon their breeding, dispositions, &c. The celebrated naturalist Temminck, in his excellent monograph of the genus Felis, adduces strong reasons for believing that the cat was originally domesticated in Egypt, and that the gloved cat (*F. maniculata*) of Egypt and Nubia is, in all probability, the original stock of the domestic cat, though the race has been much modified by frequent crossing. Its strong resemblance in size, proportions, &c., renders this opinion more acceptable than that which attributes the origin to the common European wild-cat, which is smaller, has a shorter and thicker tail, and would seem rather to be the domestic cat returned to the savage state than its original stock. (Pl. I., figs. 8, 9, at CARNIVORA.) The cat was seldom, if at all, kept by the ancient Greeks and Romans, and till long after the Christian era was rare in many parts of Europe. The origin of the name *cat* is equally dark with the early history of this domestic animal. The word exists in similar forms in all the European languages and also in some extra-European ones, but whence it originally came is unknown; probably it was derived from Egypt with the animal itself.

The subtlety and circumspection of the common cat are evinced by all its habits and movements; and the observation of this disposition has no doubt accompanied it everywhere. The domestic cat belongs to a genus better armed for the destruction of animal life than all other quadrupeds. The short and powerful jaws, moved by vigorous muscles, are supplied with most formidably trenchant teeth; a cunning disposition, combined with nocturnal habits and much patience in pursuit, gives them great advantages over their prey; and their keen lacerating claws, which are always preserved in the most acute state by the peculiar arrangement that keeps them concealed when not in use, enables them to inflict a death-blow on their victims with as much certainty as ease. The cat in a degree partakes of all the attributes of her race—lies in ambush for her prey, and seizes it by a sudden leap; plays with her captives before putting them to death; and does not limit her destruction to the mere gratification of appetite. Cold and wet are disagreeable to the cat, and electricity is especially feared by her: advantage may be taken of the latter circumstance to avert the troublesome visits of the animal. After having once received a shock from a Leyden vial, but little apprehension need be entertained of the cat's return to the same place. Of various aromatic substances, as catnep or catmint,

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CATAFALCO. See CASTRUM DOLORIS.

CATALAN GRAND COMPANY, the name given to a troop of adventurers raised by Roger di Flor about the beginning of the fourteenth century. Roger first gave his services to Frederick, king of Sicily, in his war with Robert, duke of Calabria, but when peace was concluded between the two princes, being at a loss how to maintain his soldiers, he proposed to lead them to the East to contend against the Turks, who were then desolating the eastern empire. Andronicus, then emperor of the East, gladly accepted the offered assistance of Roger, and submitted to all the conditions which he imposed. Roger set sail from Messina in Sicily in 1303 with twenty-six vessels partly equipped at his own expense. The number of the troops embarked with him is said to have amounted to about 8000 men of different nations: Sicilians, Catalans, Arragonese, &c. The Catalans, either because they were the most numerous or for some other reason, gave their name to the whole company. On his arrival at Constantinople Roger was received with great rejoicings, and was elevated to the dignity of grand-duke. A sanguinary affray between the Genoese and the Catalans marked the first period of the stay of these adventurers in Constantinople. Andronicus hastened to get them to cross over into Asia. This they did in the spring of 1304, and in the same year they defeated the Turks completely. In 1305 he took Ancyra, and forced the Turks to raise the siege of Philadelphia, but he was not so successful in his attempt to take Magnesia. After a long and ineffective siege he recrossed into Europe in 1306, bringing along with him his Catalans, who left behind them everywhere traces of their plunder and violence. When they had reached Europe they took up their quarters at Gallipoli. But Andronicus, who was by this time very anxious to be rid of his formidable allies, now received Roger with great coldness, and even obliged him to give up his title of grand-duke in favour of Berengarius. The sudden departure of Berengarius, however, and the simultaneous incursions of the Turks into Asia Minor, compelled Andronicus again to appeal to Roger and his Catalans for assistance. Roger was raised to the dignity of Cæsar to appease him for the slights that had been put on him. But this only caused him to be regarded with more jealousy by the Greeks, and especially by Michael, the son of Andronicus, who was associated with his father in the empire. The result was that before he could start once more for Asia he was assassinated (1306 or 1307). The Catalans now turned their arms

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CATACOUSTICS (from Greek *kata*, back, and *akouō*, I hear), called also *cataphonics*; the science of reflected sounds, or that part of acoustics which considers the properties of echoes. See ACOUSTICS.

CATAFALCO. See CASTRUM DOLORIS.

CATALAN GRAND COMPANY, the name given to a troop of adventurers raised by Roger di Flor about the beginning of the fourteenth century. Roger first gave his services to Frederick, king of Sicily, in his war with Robert, duke of Calabria, but when peace was concluded between the two princes, being at a loss how to maintain his soldiers, he proposed to lead them to the East to contend against the Turks, who were then desolating the eastern empire. Andronicus, then emperor of the East, gladly accepted the offered assistance of Roger, and submitted to all the conditions which he imposed. Roger set sail from Messina in Sicily in 1303 with twenty-six vessels partly equipped at his own expense. The number of the troops embarked with him is said to have amounted to about 8000 men of different nations: Sicilians, Catalans, Arragonese, &c. The Catalans, either because they were the most numerous or for some other reason, gave their name to the whole company. On his arrival at Constantinople Roger was received with great rejoicings, and was elevated to the dignity of grand-duke. A sanguinary affray between the Genoese and the Catalans marked the first period of the stay of these adventurers in Constantinople. Andronicus hastened to get them to cross over into Asia. This they did in the spring of 1304, and in the same year they defeated the Turks completely. In 1305 he took Ancyra, and forced the Turks to raise the siege of Philadelphia, but he was not so successful in his attempt to take Magnesia. After a long and ineffective siege he recrossed into Europe in 1306, bringing along with him his Catalans, who left behind them everywhere traces of their plunder and violence. When they had reached Europe they took up their quarters at Gallipoli. But Andronicus, who was by this time very anxious to be rid of his formidable allies, now received Roger with great coldness, and even obliged him to give up his title of grand-duke in favour of Berengarius. The sudden departure of Berengarius, however, and the simultaneous incursions of the Turks into Asia Minor, compelled Andronicus again to appeal to Roger and his Catalans for assistance. Roger was raised to the dignity of Cæsar to appease him for the slights that had been put on him. But this only caused him to be regarded with more jealousy by the Greeks, and especially by Michael, the son of Andronicus, who was associated with his father in the empire. The result was that before he could start once more for Asia he was assassinated (1306 or 1307). The Catalans now turned their arms against the Byzantines, in order to avenge the death of their leader, and defeated them in several battles. They then passed into Greece and entered the service of the Duke of Athens, but no long time after they turned against him and defeated him in the battle of Cephissus (1311). They now became masters of Attica, where they maintained themselves for four years, when they were finally defeated by Philes near Bizyn (1315).

CATALANI, ANGELICA, one of the most celebrated of Italian female singers, was born at Sinigaglia, in the Papal States, most probably in 1782, although several other years are given, and was educated in the convent of Santa Lucia at Rome. As early as her seventh year her magnificent voice had become the subject of general remark, but it was not till leaving the convent at the age of fourteen that she received any instruction in the higher departments of the musical art. At sixteen she was compelled by family misfortunes to turn her talents to account, and made her first appearance on the stage at Venice. She afterwards filled the grand soprano parts at the operas of Milan, Florence, Rome, and Naples, and in 1799 accepted an engagement at the opera of Lisbon, where she continued for five years. She then visited successively Madrid, Paris, London, and the principal towns of Great Britain, in all of which her success and profits were immense. In 1814 she returned to Paris to take the management of the Italian opera there, but sustained thereby severe pecuniary losses from the injudicious interference of her husband, De Valabrégue, formerly a captain in the French army. On Napoleon's return in 1815 she was obliged to resign the direction of the opera, but resumed it again on the second restoration. In 1818 she again resigned the direction of the opera (by which she had suffered great losses), and from that year till 1828 made repeated professional tours through the Continent and Great Britain. In 1830 she retired from public life to a villa which she had purchased in the neighbourhood of Florence, and here she resided with her family and gave instruction to girls who manifested indications of local talent, one condition being required from them that they should adopt the name of Catalani. In the summer of 1849, owing to the disturbed state of Tuscany, she proceeded with her daughters to Paris, and was there, shortly after her arrival, cut off by cholera on 13th June. Madame Catalani was a woman of majestic appearance, and her voice displayed a wonderful degree of power, flexibility, and compass. She rather, however, astonished and overpowered an audience than touched or subdued their hearts by her marvellous execution.

CATALDO, ST., a town, Sicily, province of and 5 miles W.S.W. Caltanissetta. The sulphur works in the environs produce annually about 37,500 cwts. Pop. 12,800.

CATALEPSY. This is a spasmodic disease, and by some regarded as a species of *tetanus*. It affects the whole body, so as to render it immovable, as if dead. *Tetanus* differs from *catalepsy* in its subjects and causes. Females are most liable to the last, while the first is equally produced in both sexes by appropriate causes. Tetanus is most frequently produced by punctured wounds of tendinous textures, and most readily in hot weather. Sometimes, however, it occurs, like catalepsy, independently of wounds. The spasm is more limited in tetanus; sometimes being most severe in the muscles of the face, producing lock-jaw; now it attacks the muscles of the trunk, on the fore part, producing *emprosthotonos;* and now the muscles of the back part, producing *opisthotonos*, or curvature of the trunk backwards. During all this the natural temperature may remain, the pulse be perfectly natural, and the senses unimpaired. Under the most active and varied treatment tetanus has always been a very fatal malady.

Catalepsy is a universal spasmodic disease of the organs of locomotion. The body remains in the position in which it may have been when attacked with the fit, and the limbs preserve any situation in which they may be placed. The senses are obliterated, and the mind totally inactive, nothing being able to rouse the patient. The pulse and temperature remain natural. The fit is of uncertain length; according to some writers not lasting more than a quarter of an hour, though known by others to be much longer. This disease is an obstinate one, and is very liable to recur, even when the patient seems in the least respect liable to a recurrence. It is, for the most part, a consequence of some other disease. This may be a local affection; but it more frequently occurs in a generally enfeebled constitution, induced by some grave malady, or one which has been caused by the gradual operation of unobserved morbid causes.

CATALOGUES OF BOOKS. See the article BIBLIOGRAPHY.

CATALONIA (ancient *Tarraconensis*), an old province of Spain, bounded N. by France, E. and S.E. by the Mediterranean, S. by Valencia, and W. by Arragon. Its form is nearly that of a triangle, the base, towards the Mediterranean, being about 80 miles in length, the side towards France 130, and that towards Arragon 140. The country in general is mountainous, but intersected with fertile valleys, while the mountains themselves are covered with valuable woods and fruit-trees, the slopes being cut in terraces and plentifully supplied with water by an artificial system of irrigation. The main river of Catalonia is the Ebro; there are also the Segre, Ter, Llobregat, and many smaller rivers. Corn, wine, oil, flax, hemp, legumes, and almost every kind of fruit, are abundant. Here are quarries of marble of all colours, of crystal and alabaster; also topazes, rubies, jaspers, and other precious stones; mines of lead, tin, iron, alum, vitriol, and salt, and formerly of gold and silver. On the coast is a coral-fishery. Catalonia is naturally much less fertile than either of the Castiles; but it far surpasses both, and indeed, every other province in Spain, in the industry of its inhabitants, as well as the improvements which they have effected in manufactures, agriculture, and commerce. Pop. (1897), 1,942,245; area 12,480 square miles. It comprises the modern provinces of Tarragona, Gerona, Lerida, and Barcelona. The principal towns are Barcelona, Tortosa, Tarragona, Gerona, Manresa, and Lerida.

CATAMARAN, a sort of raft used in the East Indies, Brazil, and elsewhere. Those of the island of Ceylon, like those of Madras and other parts of that coast, are formed of three logs. The timber preferred for their construction is the dup-wood or Cherne-Maram, the pine-varnish tree. Their length is from 20 to 25 feet, and breadth 2½ to 3½ feet. The logs of which they are constructed are secured together by means of three spreaders and cross lashings through small holes. The centre log is much the largest, and is pointed at the fore-end. These floats are navigated with great skill by one or two men in a kneeling posture. They think nothing of passing through the surf which lashes the beach at Madras, and at other parts of these coasts, when even the boats of the country could not live upon the waves, and they are also propelled out to the shipping at anchor when boats of the best construction would be swamped. In the monsoons when a sail can be got on them, a small outrigger is placed at the end of two poles as a balance, with a bamboo mast and yard, and a mat or cotton cloth sail.

CATAMARCA, a province of the Argentine Republic, bounded N. by Salta, E. by Tucuman and Santiago del Estero, S. by Cordova and Rioja, and W. by Rioja and Chili; area, about 47,530 sq. miles. The surface is very mountainous in all directions except the S., where it stretches out into a large plain. The loftiest and best known of the mountains is the Sierra de Aconquija, which stretches from S. to N., and attains in its culminating point near its S. extremity a height of more than 16,000 feet. The Santa Maria, flowing N. to its junction with the Huachipas, is the only river of the least consequence, but every valley having its stream or mountain torrent, the whole province is well watered. The only lake is the Laguna Blanca, which lies in one of four valleys formed by the Sierra de Aconquija. The soil is tolerably fertile, producing large crops of maize and wheat, and supporting large numbers of live stock, especially goats. The vine is also cultivated, and yields wine and spirits which bear a high name in the surrounding countries. The principal exports are beasts of burden, sent into Bolivia and Peru; horned cattle, which find a ready market at Copiapo, in Chili, and hides and goat-skins, raw or tanned, sent in great numbers to Buenos Ayres. Other articles are wheat, capsicums, anise-seed, tobacco, wine, spirits, and dried figs. The principal mineral is iron, but gold, silver, and lead are also found. The capital is Catamarca. Pop. (1895), 90,161, chiefly of Indian extraction, with a considerable mixture of Spaniards.

CATAMARCA, capital of the Argentine province of the same name (see above), in a fertile vale, 82 miles N.E. of Rioja, is connected by rail with Rioja and all the chief towns of the republic. It was founded about 1680, and has a fine church and a college. Pop. 7500.

CATAMENIA (derived from these two Greek words—*kata*, according to, and *mēn*, the month), menses, the monthly discharge from the uterus of females between the ages of fourteen and forty-five. Many have questioned whether this discharge arose from a mere rupture of vessels, or whether it was owing to a secretory action. There can be little doubt of the truth of the latter. The secretory organ is composed of the arterial vessels situated in the fundus of the uterus. The dissection of women who have died during the time of their menstruating proves this. Sometimes, though very rarely, women during pregnancy menstruate; and when this happens, the discharge takes place from the arterial vessels of the vagina. The quantity a female menstruates at each time is very various, depending on climate and a variety of other circumstances. It is commonly in England from 5 to 6 ounces: it rarely exceeds 8. Its duration is from three to four, and sometimes, though rarely, five days. With respect to the nature of the discharge, it differs very much from pure blood. It never coagulates, but is sometimes grumous; and membranes like the deciduo are formed in difficult menstruations. In some women it always smells rank and peculiar; in others it is inodorous. The use of this monthly secretion is said to be, to render the uterus fit for the conception and nutrition of the fœtus; therefore girls rarely conceive before the catamenia appear, and women rarely after their entire cessation, but very easily soon after menstruation (which see).

CATAMOUNT, a name of the cougar, puma, or 'painter' (*Felis concolor*), for which see PUMA.

CATANIA (anciently *Catana*), a city of Sicily, in the province of Catania, on the borders of the valley of Noto, the see of a bishop, the suffragan of Monreal; 47 miles S.S.W. Messina, 85 E.S.E. Palermo. It is situated on a gulf of the Mediterranean, at the foot of Mount Ætna. This city has been repeatedly visited by tremendous earthquakes, and partially laid in ruins by lava from eruptions of Mount Ætna. The most disastrous of the eruptions was that of 1669, by which a great number of the antiquities of Catania were overwhelmed, and the most disastrous of the earthquakes was that of 1693, when 18,000 people were destroyed. Although again greatly injured by the earthquake of 1783, Catania is now reviving with great splendour, and has much more the features of a metropolis than Palermo. The principal streets are wide and well paved with lava. Most of the edifices have an air of magnificence unknown in other parts of the island, and the town has a title to rank among the elegant cities of Europe. An obelisk of red granite, placed on the back of an antique elephant of touchstone, stands in the centre of the great square, which is formed by the town-hall, seminary, and cathedral. The cathedral is a fine building. It was founded in 1091 by Count Roger, but required to be mostly rebuilt after the earthquake of 1693. It is dedicated to St. Agatha, the patroness of the city. The suppressed Benedictine monastery of St. Nicholas, comprising a church (with splendid organ), library, museum, and other extensive buildings, was long celebrated for wealth and splendour. The university was founded about 1445. The ruins of the amphitheatre, which was more extensive than the Colosseum at Rome, are still to be seen, as also the remains of the theatre, baths, aqueducts, sepulchral chambers, hippodrome, and several temples. The industries include the manufacture of silk and cotton goods, and the mining of sulphur. The harbour was formerly a good one, but by the eruption of 1669 its entrance was almost entirely choked up, and it is only in recent times that it has been improved, a considerable amount of money having been spent on it. The trade of Catania is of some importance, the principal export being sulphur, next to which come oranges and lemons, almonds and other fruits, and wine. Cereals, textiles, and other manufactures are the chief imports. The exports have an average annual value of about £1,000,000. A circular railway runs from Catania round the base of Mount Ætna. Pop. (1896), 127,117.

CATANZARO (ancient *Catacium*), a town of South Italy, capital of the province of the same name, on a height, 8 miles from the Gulf of Squillace. It suffered severely from the great earthquake of 1783, but is still a place of some importance, defended by a citadel, and containing a cathedral and various other churches, an Academy of Sciences, one of the four great civil courts of the kingdom, a lyceum, and three hospitals. The manufactures consist chiefly of silk and velvet, and there is some trade in wheat, wine, oil, &c. The women are considered the handsomest in Calabria. Pop. in 1881, 20,931.

CATAPLASM, or POULTICE, some kind of soft compound, intended to be applied hot to the surface of the body. Poultices are commonly made of linseed-meal, oatmeal, bran, bread crumbs, &c., mixed with water, milk, or some other liquid. They are called *sinapisms*, or mustard poultices, when mustard forms their base.

CATAPULT (Latin, *catapulta*; Greek, *katapeltēs*), a name for certain machines of the ancients for projecting missiles, chiefly arrows. *Ballistæ* (Greek, *petroboloi* or *lithoboloi*) were engines somewhat similarly constructed, but were chiefly confined to the shooting of stones. *Tormentum* was a general name for all such machines. Catapults may be described as gigantic cross-bows, the most powerful of which consisted, not of a single beam or spring, but of two, inserted each into an upright coil of ropes, so twisted that the ends of the arms could not be drawn towards each other without producing a most violent recoil. These machines were described by the length of the arrow they were constructed to launch; thus there were three-span, two-ell, and other catapults. A three-ell catapult (*tripēchos*) weighed 5¼ cwts., the arrow fully 4 lbs., and five men were required to work it. The effective range was about 1200 feet. The missiles used in *ballistæ* varied in weight from 15 to 90 lbs. The Romans did not carry all the parts of these machines with them, but only the ropes and fastenings, with the necessary tools; and the soldiers built the catapults when they wanted them. They were chiefly used in siege operations. The terms *catapult* and *ballista* were often used indiscriminately; and in later times the word *catapult* went entirely out of use. Vegetius and Ammianus Marcellinus never introduce it, and employ *ballistæ* to signify all machines throwing large arrows or beams, and *onager* for those throwing stones.

CATARACT, in medicine, is an opacity of the crystalline lens of the eye, or of its capsule, or both. It is quite different from amaurosis, which is a disease of the retina, by which it is rendered unsusceptible of the action of light. In cataract the lens becomes opaque, loses its transparency, and is no longer capable of transmitting the light. The causes of cataract are numerous. Inflammation or injury to the lens may produce it. Sometimes it is ascribed to a state of the vessels of the part which prevents a proper nourishment of the lens or its capsule. It is produced by various diseases, such as gout, rheumatism, diabetes, scrofula, and often accompanies old age. Sometimes children are born with cataract. Its earliest approach is marked by a loss of the natural colour of the pupil; this becoming turbid, or slightly gray. Muscæ volitantes accompany this period. The opacity is not at first over the whole lens, but most frequently first attacks the centre portion; this being turbid, and of a grayish colour, while the surrounding portions remain transparent, and of the usual black colour. While it exists in this degree only, the person can see in an oblique direction. The colour of the pupil is various; mostly grayish-white or pearl-coloured; sometimes milk-white, or of a yellowish-gray; now and then of a grayish-brown, and even of a dark-brown or dark-gray. The consistence of the lens differs in different cases, being either hard, and even horny; or very soft, as if dissolved.

The treatment of cataract is by a surgical operation on the eye, and different operations have been tried and recommended. They all consist in removing the diseased lens from its situation opposite the transparent cornea. By one of these operations the cataract is depressed, removed downwards, and kept from rising by the vitreous humour. This is called *couching*. Another operation is *extraction*, and consists in making an incision of the cornea, and of the capsule of the lens, by which the lens may be brought forward, and through the cut in the cornea. The third operation is by *absorption*. This consists in wounding the capsule, breaking down the crystalline, and bringing the fragments into the anterior chamber of the eye, where they are exposed to the action of the aqueous humour, and are at length absorbed. This last operation has the name *keratonyxis* applied to it, and is chiefly employed in the case of children, because the lenses of their eyes are soft. The choice of the operation is determined by the character of the cataract. After the operation the patient is to be kept from the light, and from all means of irritation. Such medicines and such articles of food are to be prescribed as will most effectually prevent inflammation; and should this occur, it must be treated by such means as are the most sure to restrain or overcome it.

CATARACT, in geography, a waterfall. The English language has more words than most European languages to express different degrees of rapid and sudden descent in streams of water. The most general term is *fall* or *falls*. A considerable declivity in the bed of a river produces *rapids*; when it shoots over a precipice it forms a *cataract*; and if it falls from steep to steep, in successive cataracts, it is often called a *cascade*. In rocky countries rivers abound in falls and rapids. In alluvial districts, falls, of course, are very rare. Rapids and cataracts are often a blessing to rugged countries, since they furnish the cheapest means of driving machines in manufactories, &c. In recent times waterfalls have been utilized in the furnishing of electric power in addition to ordinary water-power, as at Niagara.

Many cataracts are remarkable for their sublimity, the grandest being the Falls of Niagara, on the Niagara River, between Lakes Erie and Ontario, in North America. The river, more than a mile above the falls, is divided by Grand and Navy Islands, and has a gradual descent of 57 feet from this place. The banks preserve the level of the country, and in some parts rise 100 feet from the water. At the falls the river is ¾ of a mile broad, and the precipice which breaks its course curves irregularly so as to form nearly a semicircle on the Canadian side, but is straighter on the American side. An island, called Goat Island, divides the cataract into two principal portions—the American fall on the east, and the Horse-shoe on the west, or Canada side. The American fall descends almost perpendicularly from a height of 162 feet, and is about 1000 feet in width. The Horse-shoe Fall is 4 feet less in height, but is wider and surpasses the other much in grandeur. The water rushes over the precipice with such force that it forms a curled sheet, which strikes the water below 50 feet from the base of the precipice, and visitors can pass behind the falling sheet of water. By the wearing action of the water on the rocky ledge over which it plunges the falls are gradually retreating, and will in time reach Lake Erie and cease to exist.

The following is an account of the principal known waterfalls after Niagara, with their respective heights, as given by the best authorities:—

The river Mortmorency, which joins the St. Lawrence a few miles below Quebec, forms a magnificent cataract, 250 feet in height. The Missouri, in the upper part of its course, descends 357 feet in 16½ miles. There are four cataracts, one of 87, one of 19, one of 47, and one of 26 feet in height. The Yo-Semite river, California, forms a series of magnificent falls, with a total descent of 2600 feet. The first of them is a plunge of 1500 feet, and is followed, after a series of beautiful cascades, by a final plunge of about 400 feet. Fully 200 miles from the mouth of the Hamilton River in Labrador there is a magnificent series of cataracts known as the Grand Falls, the largest cataract having a height of over 300 feet. In the state of Colombia, South America, a magnificent cataract, called that of Tequendama, is formed by the river Bogotá. The river precipitates itself through a narrow chasm, about 36 feet broad, to the depth of over 600 feet. On the river Potaro, in British Guiana, is a grand fall known as the Kaieteur Fall, 740 feet high, and about 370 broad, a second fall of 88 feet occurring immediately below the principal. The chief waterfall of Africa is one with which Dr. Livingstone's missionary travels first made us acquainted. This is a cataract on the Zambesi, called by the natives Mosioatunya ('Smoke sounds here'), named by him Victoria Falls. The stream, about 1860 yards broad, flowing over a bed of basaltic rock, is suddenly precipitated into a tremendous fissure, extending across the bed of the river from the right to the left bank, to the depth of about 370 feet. The breadth of this fissure or crack is only from 80 to 90 yards, and the pent-up waters, from which immense columns of vapour are continually ascending, are then hurried through a prolongation of the chasm to the left with furious violence. The so-called Cataracts of the Nile are not, properly speaking, cataracts. A more correct designation for them would be 'rapids'. The Stanley Falls on the Congo comprise seven cataracts. On the river Tugela, in Natal, there are the Tugela Falls. On the Umgeni river, in the same country, are the Falls of the Great Umgeni (364 feet) and the Kar Kloof Falls (350). There seem to be no waterfalls of more note in Asia than those of the Cavery river (which see). One of the most stupendous falls in Europe is that of the Riukanfoss ('smoking-fall'), on the river Maan, in Norway. The height of the cataract is 805 feet. In Sweden, on the river Gotha, a few miles below its outlet from Lake Wener, are the celebrated falls of Trollhätta, which have a height of over 100 feet. The cascade of Gavarnie, in the Pyrenees, is reputed the loftiest in Europe, being over 1300 feet in height. Its volume of water, however, is so small, that it is converted into spray before reaching the bottom of the fall. Another waterfall in the Pyrenees is that of Seculéjo, in the neighbourhood of Bagnères-de-Luchon. It descends from the Lac d'Espingo, into the Lac de Seculéjo or d'Oo, a singularly romantic mountain reservoir, from a height of 820 feet, and is the most copious of the Pyrenean waterfalls. The Swiss Alps likewise contain some falls of great sublimity. At Lauterbrunnen, in addition to numerous other cascades, is the renowned fall of the Staubbach, about 870 feet in height, which, however, from its small volume of water, has none of the terrific adjuncts of a cataract, and resembles, in front, a beautiful lace veil suspended from the summit of the precipice. Near Martigny is the picturesque waterfall of the Sallenche or Pissevache, the final leap of the cascade being 128 feet. The falls of the Rhine at Schaffhausen are renowned over Europe. They are 300 feet broad, and nearly 100 feet in height. In Italy, the falls of Terni, or the Cascate del Marmore on the Velino, have been immortalized by Lord Byron, and though artificial, are justly regarded as among the finest and most picturesque in Europe. They consist of three falls, the aggregate height of which may be estimated at 550 feet. The falls of the Anio or Teverone, at Tivoli, are likewise very beautiful. They too are artificial, and have a fall of about 80 feet.

Among British waterfalls, the finest are, perhaps, the falls of Foyers, on the river of the same name, on the E. side of Loch Ness, Inverness-shire. The upper fall is 40 feet in height, and the lower 165. The falls of the Clyde, three in number, viz. Bonniton fall, 30 feet, Corra Linn, 84 feet, and Stonebyres fall, 80 feet, are likewise remarkable for their beauty and grandeur. Several romantic cascades occur in the lake district in England, the principal of which are Scale Force, near Crummock Water, 190 feet high, Barrow waterfall, 124 feet, and Lodore waterfall, 100 feet, both on the E. side of Derwent Water.

CATARRH (Greek *katarreō*, I flow down), an increased secretion of mucus from the membranes of the nose, throat, and air-passages, accompanied with fever and attended with sneezing, cough, thirst, lassitude, and want of appetite. There are two species of catarrh often recognized, viz. *catarrhus à frigore*, which is very common, and is called a *cold in the head*; and *catarrhus à contagio*, the influenza, or epidemic catarrh, which, however, should not be called catarrh. Catarrh is also symptomatic of several other diseases. It is seldom fatal, except in scrofulous habits, by laying the foundation of phthisis, or, where it is aggravated by improper treatment or repeated exposure to cold, into some degree of pneumonia, when there is hazard of the patient, particularly if advanced in life, being suffocated by the copious effusion of viscid matter into the air-passages. It readily, if it passes down into the chest, may give rise to bronchitis, acute or chronic. The epidemic catarrh or influenza is generally, but not invariably, more severe than the common form of the disease. (See INFLUENZA.) The latter is usually left to subside spontaneously, which will commonly happen in a few days by observing an antiphlogistic regimen. The bowels must be kept regular, and diaphoretics employed, with demulcents and mild opiates, to quiet the cough. The patient should keep indoors and confine himself as much as possible to one room. At the outset it is well to take a warm bath and then go to bed, taking at the same time a dose of Dover's powder. Warm drinks are generally useful, the throat may be gargled with alum, and the nose washed out with warm water. When the disease hangs about the patient in a chronic form, gentle tonics and expectorants are required, as myrrh, squill, &c.

CATAWBA, WATEREE, or SANTEE, a river, United States, rising in North Carolina, in the Blue Mountains, near Morganton, running E. and then S. into South Carolina, where it is known for some distance as the Wateree, till after the confluence of the Broad River, when it takes the name of Santee, runs E. by S., and after a course of 270 miles, falls by two mouths into the sea between Charleston and Georgetown. This river gives its name to a kind of wine which has acquired some celebrity in America, the grape from which it is made having been first discovered near its sources. The wine is of two kinds, still and sparkling. The latter contains an addition of alcohol, and is most in demand. Catawba wines are mostly white, but red Catawba wine is also made.

CAT-BIRD (*Turdus* or *Galeoscoptes Carolinensis*), a numerous and well-known species of North American thrush, which annually advances from the S. with the progress of agriculture, and during the summer is found throughout the Middle and New England States, frequenting thickets of brambles or the shrubberies of gardens. The note from which the bird obtains its name is strikingly similar to the plaint of a kitten in distress, and would almost certainly deceive the ear of anyone unacquainted with the cry of this species. The cat-bird is exceedingly familiar and unsuspicious, allowing itself to be closely approached, and saluting everyone passing near its abode by its cat-like note. It is lively and active in its movements, and but for the unfortunate resemblance of its ordinary cry to the voice of an animal by no means a favourite, would be considered an agreeable bird, notwithstanding its plain, lead-coloured plumage. In winter it inhabits the extreme south of the United States, and is found also in Mexico and Central America. It arrives in the lower parts of Georgia about the end of February. It reaches Pennsylvania by the second week in April, and has its nest built by the beginning of May. For this purpose a brier or bramble thicket, a thorn bush, thick vine, or fork of a sapling, is selected. Little attention is paid to concealment, though few birds are more solicitous for the safety of their young. The nest is constructed of dry leaves, weeds, small twigs, and fine dry grass, the inside being lined with fine, black, fibrous roots. The female lays four or five eggs, of a uniform greenish-blue colour, free from spots. They generally raise two, and sometimes three broods in a season.

The admirable naturalist Wilson relates that he sometimes, when in the woods, would amuse himself with imitating the violent chirping or squeaking of young birds, in order to discover what species were in his vicinity; and these sounds, to birds in the breeding seasons, he compares to the alarm of fire in a large and populous city. On such occasions of alarm and consternation, the cat-bird is the first to make his appearance, not singly, but sometimes half a dozen at a time, flying from different quarters to the spot. Other birds are variously affected, but none show symptoms of such extreme suffering. He hurries backward and forward with hanging wings and open mouth, calling out louder and faster, and actually screaming with distress, till he appears hoarse with his exertions. He attempts no offensive measures, but he bewails, he implores, in the most pathetic terms with which nature has supplied him, and with an agony of feeling which is truly affecting. This species does not readily desert its nest; and when the eggs or young of other birds are placed in it they are content to throw out the intruders and continue their attentions to their own family. When the nest and eggs are carefully removed to another place by man, the parents follow, and do not remit their cares. Before the dawn, when there is scarcely light enough to render it visible, the cat-bird generally begins its song, while fluttering with great sprightliness from bush to bush. His notes are more singular than melodious, consisting of short imitations of other birds, but failing where strength and clearness of tone are requisite. He appears to study certain passages with great perseverance, commencing in a low key, and as he succeeds, ascending to a higher and freer note, unembarrassed by the presence of a spectator, even within a few yards. An attentive listener discovers considerable variety in his performance, apparently made up of a collection of odd sounds and quaint passages. The cat-bird is a great enemy to the common black snake or horse-runner (*Coluber constrictor*), which rifles its nest whenever an opportunity offers. As the cat-bird uniformly attacks or pursues this snake, and is frequently seen in the act of hopping eagerly after it, numerous ridiculous stories are related of its being fascinated or charmed by the snake. The testimony of Wilson and Bartram show that the bird is almost uniformly the aggressor and victor, driving the snake to its hiding-place. The cat-bird is 9 inches long, and at a short distance appears nearly black, but on a closer inspection is seen to be of a deep slate-colour above, lightest on the edges of the primaries, and of a considerably lighter slate-colour below, except under the tail-coverts, which are of a very dark-red; the tail, which is rounded, and the superior part of the head, as well as the bill and legs, are black.

CATCH, a short piece of music written generally in three or four parts; it is a sort of short canon, the second voice taking up the theme when the first has completed the first phrase, the third following the second in same manner. These compositions are most frequently of a humorous and bacchanalian character, and have been from Purcell's time very popular in England.

CATEAU, LE, or CATEAU-CAMBRÉSIS, a town, France, department of Nord, on the right bank of the Selle, 15 miles E.S.E. of Cambrai. It was once fortified, though now open, and is famous for the treaty of its name signed here in 1559, by which Henri II. of France gave up Calais to the English; and agreed to abandon all he had conquered from Spain on condition that that country would do the like with her French conquests. Altogether France lost 189 fortified towns by the treaty. Le Cateau has considerable manufactures of cotton, wool, merinoes, cambric shawls, and a considerable trade in them and in the agricultural produce of the district. Pop. (1896), 10,183.

CATECHESIS, the science which teaches the proper method of instructing beginners in the principles of the Christian religion by question and answer, which is called the *catechetical method*. Hence *catechist* and *catechise*. The art of the catechist consists in being able to elicit and develop the ideas of the youthful mind. This part of religious science was first cultivated in modern times, and Rosenmüller, Daub, Winter, Heinrich Müller, Schwarz, Palmer, and others, have particularly distinguished themselves by their writings upon it.

CATECHETICAL SCHOOLS, institutions for the elementary education of Christian teachers, of which there were many in the Eastern Church from the second to the fifth century. They were different from catechumenical schools, which were attached to almost every church, and which were intended only for the popular instruction of proselytes and children; whereas the catechetical schools were intended to communicate a scientific knowledge of Christianity. The first and most renowned was established about the middle of the second century, for the Egyptian church at Alexandria, on the model of the famous schools of Grecian learning in that place. (See ALEXANDRIAN SCHOOL.) Teachers like Pantænus, Clement, and Origen gave them splendour and secured their permanence. They combined instruction in rhetoric, oratory and music, in classical Grecian literature, and the Eclectic philosophy, with the principal branches of theological study, exegesis, the doctrines of religion, and the traditions of the church; distinguished the popular religious belief from the Gnosis, or the thorough knowledge of religion; established Christian theology as a science, and finally attacked the dreams of the Chiliasts (believers in a millennium); but by blending Greek speculations and Gnostic phantasies with the doctrines of the church, and by an allegorical interpretation of the Bible, contributed to the corruption of Christianity. The distraction of the Alexandrian church by the Arian controversies proved the destruction of the catechetical schools in that place about the middle of the fourth century. The catechetical school at Antioch appears not to have been a permanent institution like the Alexandrian, but only to have been formed around distinguished teachers, when there happened to be any in the place. There were some distinguished teachers in Antioch about the year 220. We have no certain information, however, of the theological teachers in that place, such as Lucian, Diodorus of Tarsus, and Theodore of Mopsuestia, until the latter part of the fourth century. These teachers were distinguished from the Alexandrian by more sober views of Christianity, by confining themselves to the literal interpretation of the Bible, by a cautious use of the types of the Old Testament, and by a bolder discussion of doctrines. The Nestorian and Eutychian controversies, in the fifth century, drew after them the ruin of the schools at Antioch. Of a similar character were the school instituted at Edessa in the third century, and destroyed in 489, and the school afterwards established at Nisibis, by the Nestorians, in its stead; both of which were in Mesopotamia. To these schools succeeded, at a later date, the cathedral and monastic schools, especially among the western Christians, who, as late as the sixth century, made use of the heathen schools, and had never established catechetical schools even at Rome. See SCHOOLS.

CATECHISM, a book which contains the principles and first instructions to be communicated in any branch of knowledge, particularly in religion. In modern times the word has been applied more freely than formerly. Thus we see catechisms of chemistry, history, and in France *catechisme des gens de bon sens* (a satire), *catechisme du bon ton*, &c. The word is derived from the Greek *katēcheō*, I sound, that is, into the ears of the person to be instructed. The word, however, is chiefly used to denote the books that contain the religious instruction which any sect deems most important to be taught to the children and the people in a popular and easy form, generally in the form of question and answer. In the Catholic Church each bishop has the right to make a catechism for his diocese. But in modern times their catechisms are generally a pretty close copy of the one drawn up by the Council of Trent, of which an English translation was published in London (1687), '*permissu superiorum*,' under the patronage of James II. Among Protestants the catechism of Luther acquired great celebrity, and continues to be used in Germany, where regular instruction in religion during a certain period prescribed by law must precede the confirmation, which takes place between the thirteenth year of age and the seventeenth. Clergymen, however, in some parts of that country have been allowed to publish and use their own catechisms; and it is a matter of interest to observe how the different philosophical schools of Germany have influenced the tone of the catechisms by their various systems. Some which we have seen were books of 300 pages, and rather philosophical systems, supported by numerous quotations from the Bible, than simple catechisms. Such catechisms, however, are going out of use. The catechetical mode of giving instruction had much declined previous to the Reformation, when it was revived, and numerous catechisms sprang up. Calvin wrote one, which, however, never became so popular as Luther's. In England, soon after the reformed religion was established there, a short catechism was introduced consisting of the creed, the Lord's Prayer, and the decalogue, to which a few cautious explanatory passages were added about 1549, it is supposed by Archbishop Cranmer. A Shorte Catechisme or Playne Instruction, conteynynge the Summe of Christian Learninge, sett fourth by the King's Maiesties Authoritie for all Scholemaisters to teach, was the work which closed the labours of the reformers in the reign of Edward VI., whose name it commonly bears. It was printed both in Latin and in English in 1553, and may fairly be considered as containing the sense of the Church of England then established. The catechism of the English Church now in use, and contained in the Book of Common Prayer, was based on the earlier ones, being drawn up after the primitive manner by way of question and answer. The questions and answers relative to the sacraments were subjoined at the revision of the liturgy in the beginning of the reign of James I. It consists of five parts, viz.: 1. The doctrine of the Christian covenant; 2. The articles of belief; 3. The commandments; 4. The duty and efficacy of prayer; and 5. The nature and end of the holy sacraments. This catechism is generally accepted by all sections of the Anglican Church, but an additional question and answer have been inserted by the Irish Church bearing on the doctrine of the eucharist. Some alterations have also been made by the Episcopal Church in America. The catechism of the Church of Scotland is that agreed on by the Assembly of Divines at Westminster, with the assistance of commissioners from the Church of Scotland, and approved of by the General Assembly in the year 1648. What is called the Shorter Catechism is merely an abridgment of the Larger, and is the one in most common use. In France some of the catechisms have exhibited plain marks of political influence. The catechism of the first French Empire, for instance, explicitly states in what light Napoleon I. and his family were to be regarded.

CATECHU, also called *terra Japonica* and *Cutch*, an extract prepared from the wood and the green fruit of the *Acacia catechu* and of several other trees of the same family which grow in the East Indies, principally in Bengal. There are three sorts of catechu. The first, *Bombay catechu*, is in square pieces of a reddish-brown colour, friable, of a uniform texture, fracture uneven, of a specific gravity of about 1·39. The second, *Bengal catechu*, is in round pieces, of the weight of 3 or 4 ounces, of a deep chocolate colour internally, and resembling iron rust externally, more friable, of the specific gravity of 1·28. The third kind, *catechu in masses*, is in irregular pieces of 2 or 3 ounces, of a reddish-brown colour, shining, homogeneous, and wrapped up in large-nerved leaves. These three kinds of catechu are inodorous, of an astringent taste at first, but soon after sweet and agreeable; at least this is the case with the first and last sort. Terra Japonica is the name which was applied to the substance when it was first imported from Japan as an astringent earth. Catechu is largely used in tanning leather, and a yellow colouring matter, obtained from it by nitric acid, is employed in dyeing wool and silk. Catechu consists of catechin, a white crystalline silky powder, and catechu-tannic acid, a variety of tannin.

CATECHUMENS is a name which was applied to those converted Jews and heathens in the first ages of the church who were to receive baptism, had a particular place in the church, but were not permitted to be present at the celebration of the sacrament. Afterwards it was applied to those young Christians who, for the first time, wished to partake of this ordinance, and for this purpose went through a preparatory course of instruction.

CATEGORY, in logic, an assemblage of all the beings contained under any genus or kind ranged in order. Metaphysicians distribute all beings, all the objects of our thoughts or ideas, into certain genera or classes, which classes the Greeks call *categories*, and the Latins *predicaments*. The ancients, following Aristotle, generally make ten categories. Under the first all substances are comprised, and all accidents or attributes under the nine last, viz. *quantity*, *quality*, *relation*, *action*, *passion*, *time*, *place*, *situation*, and *habit*. This arrangement, however, is now almost excluded. Descartes thought that all nature may be better considered under these seven divisions—*spirit*, *matter*, *quantity*, *substance*, *figure*, *motion*, and *rest*. Others make but two categories, *substance* and *attribute*, or *subject* and *accident*; or three, accident being divided into the *inherent* and *circumstantial*. The arrangement of the ten categories was borrowed from the Pythagorean school. It is said to have been invented by Archytas of Tarentum. From him it passed to Plato (who, however, admitted only five categories—*substance*, *identity*, *diversity*, *motion*, and *rest*), and from Plato to Aristotle. The Stoics held four—*subjects*, *qualities*, *independent circumstances*, *relative circumstances*. The term categories is applied by J. S. Mill to the most general heads under which everything that may be asserted of any subject may be arranged. Of these five are recognized by Mill; namely, existence, co-existence, sequence or succession, causation, and resemblance. This arrangement affords a general classification of all possible propositions, which must thus either affirm or deny the existence of one or more things or attributes, the co-existence, sequence, or resemblance of two or more things or attributes, or must affirm or deny that one thing is the cause of another. Causation, however, is regarded by him only as a peculiar case of succession, so that the five categories of Mill may be considered to be reduced to four, causation being omitted. For the categories of Kant, see KANT.

CATENARY, that curve which is formed by a cord when allowed to hang freely betwen two points. A knowledge of the properties of this curve is of essential service to the civil engineer, since it has been found the best suited for domes, and is also the curve assumed by the chains of a suspension-bridge.

CATERPILLAR. See BUTTERFLY.

CATGUT is made from the intestines of different quadrupeds, particularly those of sheep. The manufacture is chiefly carried on in Italy and France. The texture from which it is made is that which anatomists call the *muscular coat*, which is carefully separated from the peritoneal and mucous membranes. After a tedious process of steeping, scouring, fermenting, inflating, &c., the material is twisted, rubbed with horse-hair cords, fumigated with burning sulphur to improve its colour, and dried. Cords of different size, and strength, and delicacy, are obtained from different domestic animals. The intestine is sometimes cut into uniform strips, with an instrument made for the purpose. To prevent offensive effluvia during the process, and to get rid of the oily matter, the French make use of an alkaline liquid called *eau de Javelle*. Catgut for stringed instruments, as violins and harps, is made principally in Rome and Naples. For the smallest violin strings three thicknesses are used; for the largest seven; and for the largest bass-viol strings 120. It is well known that the membranes of lean animals are tougher than those in a high-fed condition, and there can be no doubt that from the lean and small-sized Italian sheep strings superior to all others are produced. In Naples, whence the best treble strings, commonly called *Roman*, are obtained, there are large manufactories of this article.

CATHARI, a denomination which was applied, from the middle of the eleventh to the thirteenth century to several sects, that appeared first in Lombardy, and afterwards in other countries of the West, and which were violently persecuted on account of their Manichean tenets and usages. As they originated in Bulgaria they were sometimes termed *Bulgarians*, whence arose the French term of abuse, *Bougres*. Sometimes, in token of their contemptibleness as men of the lowest class, they were called *Patarenes* or *Patarines*, from Pataria, a region of bad reputation near Milan; sometimes *Publicans* or *Popelites*, and in the Low Countries *Piphles*. But the name by which they chose to be known was *Cathari*, from Greek *katharoi* the pure.

The religious views and practice of the sects comprehended under this name differed much, according to the age and country in which they appeared, and according to the spirit of their leaders; but they all agreed in an obstinate resistance to Catholicism, and in the following points of doctrine and religious life. —In common with the old Manicheans, but without esteeming Manes a prophet, they entertained an aversion to the mixture of Judaism in Christianity, professed the dualism couched in scriptural language, which places the devil nearly on a level with God, and entertained the conceit of a high moral perfection. The influence of Arian and Platonic notions was conspicuous in their explanations of the doctrine of the Trinity, which defined the Father to be the unity of the divine will, the Son or Logos to be his first thought, and the Spirit to be their common operation. The merit of the Redeemer they believed to consist more in his example than in his expiatory death, and built their hopes of happiness, for the consummation of which a resurrection of the body did not appear to them requisite, on their own virtue. They regarded the exaltation of the soul over the mortal nature, so as to become wholly absorbed in mystical contemplation, as the highest stage in religious life. They despised the mass and similar ceremonies as mere vanity. The adoration of the cross, of saints, and relics, together with all arbitrary penances, they deemed idle superstition. The daily blessing of their meats and drinks they esteemed equivalent to the celebration of the eucharist. The imposition of the hands of spotless teachers served for the communication of the Spirit, for baptism, and as a pledge of the forgiveness of sins. Deep devotion of the heart in prayer, and a life of purity, connected with abstinence from sexual pleasure, and from the use of stimulating food, were their exercises of piety. They insisted on the restoration of the apostolic simplicity, and the literal fulfilment of the precepts of the New Testament, which they read, indeed, with assiduity, but frequently misunderstood. In an age when the heartless subtleties of dialectics, the mechanical administration of divine worship, and the scandalous morals of the clergy, widened more and more the breach between religion and the Established Church, such doctrines and maxims necessarily met with approbation. The piety and morality at which most of the separatists diligently aimed, the charm of their secret connection, and the high intelligence of things sacred to which they made claim, and the moving power of their simple worship, procured them many adherents, and those not from the common people merely. They were joined by the discontented of all classes, even by the clergy and nobles; and in the rude state of the existing political constitutions, amid the confusion of civil wars and ecclesiastical controversy, their congregations, with little mutual connection, were able to pursue for years their quiet course. But these sects were not free from corruptions. The nocturnal assemblies, the community of goods, the homeless, roving life (on account of which several of them were called *Passageri*, *Passagini*), and the contempt of the marriage state gave rise, in many cases, since they permitted the two sexes to live together, to gross immoralities; and the mystery in which they enveloped their religious exercises sometimes served to conceal the errors of an unbridled fanaticism. But when the old denominations became disgraced by such errors new leaders gave rise to new sects, and imparted a fresh impulse to the once excited spirit of separation. From this originated the excitements occasioned among the people of France, Switzerland, and Italy, by Peter Bruys, and Henry and Arnold of Brescia, in the twelfth century, which introduced the names *Petrobrusians*, *Henricians*, and *Arnoldists*. See ARNOLD OF BRESCIA.

The ecclesiastical authority now became zealous in searching out and punishing heretics; so that these new but unconnected classes of Cathari soon became extinct. The older Cathari, Publicans, Patarenes, &c., had the prudence, wherever they were settled, to adhere publicly to the Catholic Church, and to hold their private meetings in the night. They even allowed members to have recourse before the spiritual courts to an apparent recantation; but the attention of these authorities being once excited, and the popes carrying on the persecution of the heretics by their own legates, and establishing the horrible Inquisition in the thirteenth century, the utmost secrecy in the performance of religious exercises no longer afforded security to these heterodox believers. The fate of the Albigenses, who were mainly Cathari, finally produced the overthrow of all this family of sects in the thirteenth century. The Waldenses alone, who were unjustly confounded with the Cathari, escaped.

CATHARINE I., Empress of Russia. The early history of this remarkable woman is uncertain. According to some accounts she was the daughter of a Swedish officer named Rabe, who died shortly after she was born; according to others her father was a Catholic peasant in Lithuania, by name *Samuel*, for he had (as is frequently the case there) no family name. It is said that she was born in 1686, named *Martha*, and placed by her poor parents in the service of a Lutheran clergyman named *Daut* at Roop, in the circle of Riga. She then removed to Marienburg, a small village in the circle of Wenden, and entered the service of a clergyman named *Glück*, who caused her to be instructed in the Lutheran religion. Here she was married to a Swedish dragoon. But a few days after he was obliged to repair to the field, and the Russians, within a short period, took Marienburg in 1702. Martha fell into the hands of General Tcheremetieff, who relinquished her to Prince Menzikoff. While in his possession she was seen by Peter the Great, who made her his mistress. She became a proselyte to the Greek Church, and assumed the name of *Catharine Alexiewna*. In 1708 and 1709 she bore the emperor the Princesses Anna and Elizabeth, the first of whom became the Duchess of Holstein by marriage, and mother of Peter III. The second became Empress of Russia. In 1712 the emperor publicly acknowledged Catharine as his wife. She was subsequently proclaimed empress, and crowned in Moscow in 1724. Besides the daughters above named she bore the emperor five more children, all of whom died early. The Princesses Anna and Elizabeth were declared legitimate. By her kindness, and above all by her intelligence, she gained possession of the heart of the emperor. When Peter, with his army, seemed irreparably lost on the Pruth in 1711 Catharine endeavoured to win over the grand vizier; and having succeeded, by bribing his confidant with her jewels, she disclosed her plan to the emperor, who gave it his approbation, and was soon relieved. She afterwards received many proofs of the gratitude of her husband. Peter even deemed her worthy of being his successor. But in the latter part of 1724 she fell under his displeasure. Her chamberlain Moens, with whom she was suspected of being on too intimate terms, was beheaded on pretence that he had been bribed by the enemies of Russia. Menzikoff, who had always manifested much attachment to her, had now been in disgrace for some time, and Peter had very frequent attacks of bodily pain, with intervals only marked by dreadful explosions of rage. These circumstances made Catharine's situation critical, and her anticipations of the future must have been the more melancholy, as the emperor had uttered some threats of a change in the succession to her disadvantage. To prevent such an event she applied to Menzikoff; and by the prudence of Jaguschinski, who then enjoyed the favour of Peter, and whom she gained over, a reconciliation was effected with the emperor. The empress and the favourite were labouring to confirm their improving prospects when Peter the Great died, Jan. 28, 1725. Catharine, Menzikoff, and Jaguschinski considered it necessary to keep the death of the emperor a secret until, by judicious arrangements, they had secured the succession of the throne to the empress. Theophanes, archbishop of Plescow, swore before the people and troops that Peter on his death-bed had declared Catharine alone worthy to succeed him in the government. She was then proclaimed Empress and autocrat of all the Russias, and the oath of allegiance to her was taken anew. At first the cabinet pursued the plans of Peter, and, under Menzikoff's management, the administration was conducted with considerable ability. But the pernicious influence of favourites was soon felt, and great errors crept into the administration. Catharine died suddenly on the 17th of May, 1727, in the forty-second year of her age. Her death was probably hastened by excess in the use of ardent spirits.

CATHARINE II., Empress of Russia, a woman of remarkable ability, was born at Stettin, 2d May, 1729, where her father, Christian Augustus, prince of Anhalt-Zerbst, and Prussian field-marshal, was governor. Her name was originally *Sophia Augusta*. The Empress Elizabeth, at the instigation of Frederick II., chose her for the wife of Peter, her nephew, whom she appointed her successor. The young princess accompanied her mother to Russia, where she joined the Greek Church, and adopted the name of *Catharine Alexiewna*, given to her by the empress. The marriage was celebrated Sept. 1st, 1745. It was not a happy one, but Catharine found relief in the improvement of her mind. She was endowed with uncommon strength of character; but the ardour of her temperament and the ill-treatment of her husband led her into errors which had the most injurious influence on her whole political life. Amongst the friends of her husband Count Soltikoff was distinguished for talent and the graces of his person. He attracted the attention of Catharine, and an intimate connection between them was the consequence. When Soltikoff, who was employed in foreign embassies, grew indifferent to Catharine, a young Pole, Stanislaus Augustus Poniatowski, celebrated both for his good and ill fortune, gained the affections of the grand princess. Their intimacy was known to the empress, but did not appear to displease her; and it was at her recommendation that Augustus III. appointed Poniatowski his ambassador at the court of St. Petersburg. This connection created alarm at Paris. France, at that time at war with Britain, had formed a secret treaty with Austria, and drawn Russia into the same. Poniatowski was known to be a warm adherent of Britain, and it was feared that through his influence with the princess he might prejudice Elizabeth against France; and Louis XV. endeavoured to induce the King of Poland to recall him. In January, 1762, Elizabeth died, and Peter III. ascended the throne. The emperor now became still more alienated from his wife. Peter lived in the greatest dissipation, and on such intimate terms with a lady of the court, named Elizabeth Woronzoff, that it was generally thought that he would repudiate Catharine and marry his mistress. The empress, therefore, was obliged to take measures for her personal security. At the same time Peter grew continually more and more unpopular with his subjects, owing to his blind predilection for the Prussian military discipline, his politics, and the faults of his character. This led to a conspiracy, at the head of which were the hetman Count Rasumowski, Count Panin, the enterprising Princess Daschkoff, and a young officer of the guards, Gregory Orloff, who, since Poniatowski's departure, had taken his place in Catharine's affections. All those who were dissatisfied, or who expected to gain by a change, joined this conspiracy. Panin and the greater part of the conspirators were actuated only by the desire to place the youthful Paul on the throne, under the guardianship of the empress and a council of the empire. But this plan was changed through the influence of the Orloffs. The guards were the first to swear allegiance to the empress on her presenting herself to them at Peterhoff on the morning of July 9, 1762; and Alexei Orloff prevailed on Teplow, who was afterwards appointed senator, to read at the Kazan church, instead of the proclamation of the conspirators in favour of the young prince, one announcing the elevation of Catharine to the throne. Peter died a few days after in prison. The accusation against Catharine of having contributed to hasten this event is without foundation. The young, ambitious princess, neglected by her husband, whom she did not respect, remained passive on the occasion, yielded to circumstances, which were, it is true, propitious to her, and consoled herself for an event which she could not remedy. She knew how to gain the affections of the people by flattering their vanity; showed great respect for their religion; caused herself to be crowned at Moscow with great pomp; devoted herself to the promotion of agriculture and commerce, and the creation of a naval force; improved the laws; and showed the greatest activity in the administration of the internal as well as the external affairs of Russia. A year after her ascension to the throne she forced the Courlanders to displace their new duke, Charles of Saxony, and to recall Biren, who was extremely odious to the nobles. After the death of Augustus III., king of Poland, she was the means of Stanislaus Poniatowski's being crowned at Warsaw. But whilst she was forcing this king on the Poles, the number of the malcontents in her own empire increased, and several attempts against her life were made at St. Petersburg and Moscow. The young Ivan (which see) was the person to whom the hopes of the conspirators were directed; but his sudden death at the fortress of Schlüsselburg overthrew the plans of the disaffected. After this the court of the empress was only disturbed from time to time by intrigues, in which gallantry and politics went hand in hand, and which had no other object than to replace one favourite by another. In the midst of pleasure and dissipation Catharine did not neglect the improvement of the laws. Deputies from all the provinces met at Moscow. The empress had herself prepared instructions for their conduct, which were read at the first session; but it was impossible for so many different nations to understand each other, or to be subject to the same laws. In the first sessions the emancipation of the peasants was proposed. This alone would have been sufficient to cause a bloody revolution. Catharine, who presided at the debates, and received from the assembly the title of *mother of the country*, soon dismissed the discordant legislators. About this time France formed a party in Poland against Russia; but these attempts only served to accelerate Catharine's plans. The war to which the Porte was instigated had the same result. The Turks were beaten. The Russian flag was victorious on the Greek seas; and on the banks of the Neva the plan was formed of re-establishing the republics of Sparta and Athens as a check to the Ottoman power. The advancement of Austrian troops into Poland inspired Catharine with the desire to aggrandize herself in this quarter. She therefore entered into an agreement for the division of the country with the courts of Berlin and Vienna in 1772, by which the governments of Polotzk and Mohilev fell to her share, and she insured to herself exclusive influence in Poland by undertaking to guarantee the Polish constitution. At the same time she abandoned all her conquests, with the exception of Azoph, Taganrog, and Kinburn, in the peace with the Porte, concluded at Kainardschi in 1774, but secured to herself the free navigation of the Black Sea, and stipulated for the independence of the Crimea. By this apparent independence the Crimea became, in fact, dependent on Catharine. This peace was as opportune as it was advantageous to Russia; for in the third year of the war Moscow and several other cities were desolated by the plague; and about the same time an adventurer named Pugatscheff, assuming the name of Peter III., had excited a revolt in several provinces of Eastern Russia, which was soon suppressed. At this time Potemkin exercised an unlimited influence over the empress. In 1784 he succeeded in conquering the Crimea, to which he gave its ancient name of *Tauris*, and extended the confines of Russia to the Caucasus. Catharine upon this traversed the provinces which had revolted under Pugatscheff, and navigated the Volga and Dnieper, taking greater interest in the expedition, as it was attended with some danger. She was desirous, likewise, of seeing Tauris. Potemkin turned this journey, which took place in 1787, into a triumphal march. Throughout a distance of nearly 1000 leagues nothing but feasts and spectacles of various kinds were to be seen. Palaces were raised on barren heaths, to be inhabited for a day. Villages and towns were built in the wildernesses, where a short time before the Tartars had fed their herds. An immense population appeared at every step—the picture of affluence and prosperity. A hundred different nations paid homage to their sovereign. Catharine saw, at a distance, towns and villages, of which only the outward walls existed. She was surrounded by a multitude of people, who were conveyed on during the night, to afford her the same spectacle the following day. Two sovereigns visited her on her journey—the King of Poland, Stanislaus Augustus, and the emperor Joseph II. The latter renewed his promise, given at St. Petersburg, to assist her in her projects against the Turks. The result was a new Turkish war, which, by the Peace of Jassy (1792), ended not less favourably for Russia than the first. The power of Russia was also increased by the war with Sweden which terminated in 1790, and by the two last partitions of Poland and the incorporation of Courland. Catharine took no part in the war against France, though she broke off all connection with the French republic, actively assisted the emigrants, and entered into an alliance with England against France. She likewise made war against Persia, and, as some historians assure us, entertained the project of destroying the power of the English in Bengal, when a fit of apoplexy put an end to her life, Nov. 17, 1796.

Catharine II. has been equally censured and praised. With all the weakness of her sex, and with a love of pleasure carried to licentiousness, she combined the firmness and talent of a powerful sovereign. Two passions were predominant with her until her death, love and ambition. She was never without her favourite, yet she never lost sight of her dignity. She was distinguished for activity, working with her ministers, writing letters to Voltaire and Diderot, and signing an order to attack the Turks, or to occupy Poland, in the same breath. She favoured distinguished authors, and was particularly partial to the French. At Paris she had a literary agent (Baron Grimm). She several times invited Voltaire to her court, proposed to D'Alembert to finish the Encyclopædia at St. Petersburg, and to undertake the education of the grand-duke. Diderot visited her at her request, and she often allowed him the privilege of familiar conversation with her. By these means she gained the favour of the literati of Europe, who called her the greatest of rulers; and, in fact, she was not without claims to this title. She protected commerce, improved the laws, dug canals, founded towns, hospitals, and colleges. Pallas and others travelled at her expense. She endeavoured to put a stop to the abuses which had crept into the administration of the different departments of government; but she began without being able to finish. Civilization advanced but slowly in Russia under her reign; and her anxiety to enlighten her subjects ceased when she began to entertain the idea that the French revolution had been brought about by the progress of civilization. Laws, colonies, schools, manufactures, hospitals, canals, towns, fortifications, everything was commenced, but frequently left unfinished for want of means. See Tooke's Life of Catharine II. and Herzen's Mémoires de l'Impératrice Catharine II. (London, 1859).

CATHARINE, St., a virgin of Alexandria who, according to Catholic tradition, suffered martyrdom early in the third century. She is represented with a piece of a wheel; and the legend of her marriage with Christ has been painted by several of the first masters. Correggio's Catharine, in Dresden, is beautiful.—There are two other St. Catharines mentioned. —The knights of St. Catharine on Mount Sinai are an ancient military order, instituted for the protection of the pilgrims who came to visit the tomb of St. Catharine on this mountain. In Russia the order of St. Catharine is a distinction for ladies, instituted by Catharine, wife of Peter the Great, in memory of his signal escape from the Turks in 1711.

CATHARINE DE' MEDICI, wife of Henry II., king of France, born at Florence in 1519, the only daughter of Lorenzo de' Medici, duke of Urbino, and the niece of Pope Clement VII. Francis I. consented that his son Henry should marry her only because he did not believe she ever would ascend the throne, and because he was in great want of money, with which Lorenzo could furnish him. The marriage was celebrated at Marseilles in 1533. Catharine was equally gifted with beauty and talents, and had cultivated her taste for the fine arts in Florence; but at the same time imbibed the perverted principles of politics then prevailing in Italy. These, consisting in a constant practice of cabal, intrigues, and treachery, are particularly injurious in the government of large empires. Catharine's ambition was unbounded. She sacrificed France and her children to the passion for ruling; but she never aimed steadily at one great end, and had no profound views of policy. The situation in which she was placed, on her arrival at the French court, gave her great opportunity to perfect herself in the art of dissimulation. She flattered alike the Duchess d'Etampes, the mistress of the king, and Diana de Poitiers, the mistress of her own husband, though these two ladies hated each other. From her apparent indifference she might have been supposed inclined to shun the tumult of public affairs; but when the death of Henry II. in 1559 made her mistress of herself, she plunged her children in a whirl of pleasures, partly to enervate them by dissipation, partly from a natural inclination towards prodigality; and in the midst of these extravagances cruel and bloody measures were executed, the memory of which still makes men shudder. Her authority was limited under the reign of Francis II., her eldest son, who, in consequence of his marriage with the unfortunate Mary Stuart, was entirely devoted to the party of the Guises. Jealous of a power she did not exercise, Catharine then decided to favour the Protestants. If it had not been for her patronage, by which the ambition of the chiefs of the Huguenots was stimulated, the conflicting religious opinions in France never would have caused such lasting civil wars. Catharine felt herself embarrassed by this indulgence towards the innovators, when the death of Francis II. placed the reins of government, during the minority of Charles IX., in her hands. Wavering between the Guises on one side, who had put themselves at the head of the Catholics, and Condé and Coligny on the other, who had become very powerful by the aid of the Protestants, she was constantly obliged to resort to intrigues, which failed to procure her as much power as she might easily have gained by openness of conduct. Despised by all parties, but consoled if she could deceive them; taking arms only to treat, and never treating without preparing the materials for a new civil war, she brought Charles IX., when he became of age, into a situation in which he must either make the royal authority subordinate to a powerful party, or cause part of his subjects to be massacred, in the hope, at best a doubtful one, of subduing faction. The massacre of St. Bartholomew (see Bartholomew's Day, St.) was her work. She induced the king to practise a dissimulation foreign to his character; and as often as he evinced a disposition to free himself from a dependence of which he was ashamed, she knew how to prevent him, by the fear and jealousy which she excited in him by favouring his brother Henry. After the death of Charles IX. Catharine became again regent of the kingdom, till the return of Henry III., then king of Poland. She contributed to the many misfortunes of his reign, by the measures which she had adopted previously to its commencement, and by the intrigues in which she was uninterruptedly engaged. At her death, in 1589, France was in a state of complete dismemberment. The religious contests were in reality very indifferent to her. The consequences she was not able to conceive. She was ready to risk life for the gratification of her ambition. She was equally artful in uniting her adherents, and in promoting dissension among her adversaries. To those who directed her attention to the prodigal expenditure of the public treasure, she used to say, 'One must live.' Her example contributed greatly to promote the corruption of morals which prevailed in her time. Her manners, however, were elegant, and she took a lively interest in the sciences and arts. She procured valuable manuscripts from Greece and Italy, and caused the Tuileries and the Hotel de Soissons to be built. In the provinces, also, several castles were erected by her order, distinguished for the beauty of their architecture, in an age when the principles of the art were still unknown in France. She had two daughters, Elizabeth, married to Philip II. of Spain in 1559, and Margaret of Valois, married to Henry of Navarre, afterwards Henry IV.

CATHARINE OF ARRAGON, Queen of England, the youngest daughter of Ferdinand of Arragon and Isabella of Castile, was born in 1483 or 1485. In 1501 she was married to Arthur, prince of Wales, son of Henry VII. Her husband dying about five months after, the king, unwilling to return her dowry, caused her to be contracted to his remaining son, Henry, and a dispensation was procured from the pope for that purpose. In his fifteenth year the prince made a public protest against the marriage; but at length yielding to the representations of his council, he consented to ratify the contract, and on his accession to the throne in 1509 was crowned with her.—The inequality of their ages and the capricious disposition of Henry were circumstances very adverse to the durability of their union, and it seems surprising that Catharine should have acquired and retained an ascendency over the affections of the king for nearly twenty years. The want of male issue, however, proved a source of disquietude to him, and scruples, real or pretended, at length arose in his mind concerning the legality of their union, which were greatly enforced by a growing passion for Anne Boleyn, one of the queen's maids of honour. He made application to Rome for a divorce from

Catharine. An encouraging answer was returned, and a dispensation promised, it being the interest of the pope to favour the English king. Overawed, however, by the power of the Emperor Charles V., Catharine's nephew, the conduct of the pontiff became embarrassed and hesitating. Catharine, meanwhile, conducted herself with gentleness and firmness, and could not in any way be induced to consent to an act which would render her daughter illegitimate, and stain her with the imputation of incest. Being cited before the papal legates, Cardinals Wolsey and Campeggio, in 1529, she declared that she would not submit her cause to their judgment, but appealed to the court of Rome; which declaration was declared contumacious. The subterfuges of the pope at length induced the king to decide the affair for himself; and the resentment expressed on this occasion by the court of Rome provoked him to throw off his submission to it, and declare himself head of the English church—an act of royal caprice more important than most in history. In 1532 he married Anne Boleyn; upon which Catharine, no longer considered queen of England, retired to Ampthill in Bedfordshire. Cranmer, now raised to the primacy, pronounced the sentence of divorce, notwithstanding which, Catharine still persisted in maintaining her claims. She died in January, 1536. Shortly before her death she wrote a letter to the king, recommending their daughter (afterwards Queen Mary) to his protection, praying for the salvation of his soul, and assuring him of her forgiveness and unabated affection. The pathos of this epistle is said to have drawn tears from Henry. He had never presumed to call the virtues of his injured wife in question, and she certainly acted throughout with eminent dignity and consistency. Several devotional treatises have been attributed to Catharine, which belong to Queen Catharine Parr.

CATHARINE OF BRAGANZA, wife of Charles II., king of England, and daughter of John IV., king of Portugal, was born in 1638. In 1661 she married Charles II., in whose court she long endured all the neglect and mortification to which his dissolute conduct necessarily exposed her, and which became still more galling from her having no children; still she conducted herself with great equanimity, and after the death of Charles, received much attention and respect. In 1693 she returned to Portugal, where, in 1704, she was made regent by her brother, Don Pedro, whose increasing infirmities rendered retirement necessary. In this situation Catharine showed considerable abilities, carrying on the war against Spain with great firmness and success. She died in 1705.

CATHARINE OF FRANCE, Queen of England, youngest child of Charles VI. and Isabella of Bavaria, was born in 1401, and in 1420 was married to Henry V. of England, who was then declared successor to the crown of France. To this prince she bore Henry VI., crowned in his cradle king of both countries. After the death of Henry, in 1422, Catharine privately married Owen Theodore, or Tudor, a Welsh gentleman of small fortune, but descended from the ancient British princes. By this marriage she had two sons, the eldest of whom, Edmund, earl of Richmond, by a marriage with Margaret Beaufort, of the legitimated branch of Lancaster, became father of Henry VII. and founder of the house of Tudor. Catharine was treated with some rigour on the discovery of her second marriage, and died in the prime of life in 1438.

CATHARINE PARR, sixth and last wife of Henry VIII., was the eldest daughter of Sir Thomas Parr of Kendal, and was at an early age distinguished for her learning and good sense. She was first married to Edward Burghe, and secondly to John Neville, lord Latimer, and after his death attracted the notice of Henry VIII., whose queen she became in 1543. Her zealous encouragement of the reformed religion excited the anger and jealousy of Gardiner, bishop of Winchester, the Chancellor Wriothesley, and others of the Catholic faction, who conspired to ruin her with the king. Taking advantage of one of his moments of irritation, they accused her of heresy and treason, and prevailed upon the king to sign a warrant for her committal to the Tower. This being accidentally discovered to her, she repaired to the king, who began to sound her opinions. Aware of his purpose she humbly replied, 'that on such topics she always referred herself to the wisdom of his majesty, as he, under God, was her only supreme head and governor here on earth.' 'Not so, by St. Mary, Kate,' replied Henry; 'you are, as we take it, become a doctor, to instruct, and not to be instructed by us.' Catharine judiciously replied that she only objected in order to be benefited by his superior learning and knowledge. 'Is it so, sweetheart?' said the king; 'and tended your arguments to no worse end? Then are we perfect friends again.' After the death of the king she espoused the Lord-admiral Sir Thomas Seymour, uncle to Edward VI.; but this connection involved her in troubles and difficulties. She died in childbed in 1548, not without suspicion of poison. She was a zealous promoter of the Reformation. Among her papers, after her death, was found a composition entitled, Queen Catharine Parr's Lamentations of a Sinner bewailing the Ignorance of her Blind Life; a contrite meditation on the years she had passed in Catholic fasts and pilgrimages. It was published with a preface by Lord Burleigh, in 1548. In her lifetime she published a volume of Prayers or Meditations, wherein the Mind is stirred patiently to Suffer all Afflictions here, and to set at nought the vaine Prosperitie of this Worlde, and also to long for the everlasting Felicitee. Many of her letters have also been printed.

CATHCART.—1. William Shaw, Earl of, was the son of Baron Cathcart of Cathcart, in the county of Renfrew, and born on 17th September, 1755. He studied at Glasgow College, then entered the army, and served with distinction first in the American war and afterwards in the campaigns against the French republic in Flanders and Germany. In 1801 he was made lieutenant-general, and in 1803 commander-in-chief for Ireland. In 1807 he was appointed commander of the land forces in the expedition against Copenhagen, and was created a viscount for his services on this occasion. In 1812 he proceeded to Russia as minister-plenipotentiary, joined the Emperor Alexander at the head-quarters of the Russian army, and accompanied him through the campaigns of 1813–14. He entered Paris with the allied sovereigns, and was present at the Congress of Vienna. The same year he was created an earl. Subsequent to this he resided for several years at St. Petersburg as ambassador to the Russian court. He died at his seat of Cartside, near Glasgow, on 17th June, 1843. ——2. Charles Murray, Earl of, eldest son of the foregoing, and formerly known as Lord Greenock, was born on 21st Dec. 1783, served under Wellington in the Peninsula and at Waterloo, was in 1830 created a major-general, and in 1851 appointed commander-in-chief in Canada. He died in July, 1859. ——3. Sir George, younger brother of the foregoing, was born in London on 12th May, 1794, and educated at Eton and Edinburgh. He entered the 2d Life Guards in 1810, accompanied his father as *attaché* to Russia, and subsequently acted as aide-de-camp to the Duke of Wellington at Waterloo. In

1828 he was made lieutenant-colonel, and served for several years in Nova Scotia and the West Indies. In 1834 he retired on half-pay, but in 1837, on the outbreak of the commotions in Canada, was appointed to the command of the troops s. of the St. Lawrence, and rendered important services in quelling the revolt. In 1844 he received the honorary appointment of governor of the Tower of London, and in 1852 was made governor at the Cape of Good Hope. In this capacity he displayed great energy and military abilities in the measures by which he subdued the Caffre insurrection. Immediately thereafter he returned to England, where he was appointed to the command of a division in the expedition to the Crimea. He fell fighting bravely at the battle of Inkermann, on 5th November, 1854. Sir George Cathcart is the author of an interesting work entitled, Commentaries on the War in Russia and Germany in 1812 and 1813 (London, 1850).

CATHEDRAL, the Episcopal church of a diocese. The word is derived from the Greek *kathedra*, a seat or bench. From the early times of the Christian church the bishop presided in the presbytery or the assembly of priests. He was seated on a chair, a little higher than that of the others. The whole meeting of priests was called *cathedra;* and at a later period, when Christians were allowed to build churches, this name was applied to the Episcopal churches, and the name *basilica* to the particular churches erected in honour of a saint or a martyr. In the middle ages the cathedral received the form of the cross. We subjoin a list of the more notable cathedrals: St. Peter's (at Rome), founded in 1450, finished in 1614; colonnade added in 1667. Dimensions—length of interior, 602 feet; length of transept, 445 feet; height of nave, 150 feet; extreme height of dome, 430 feet; diameter, 193 feet. The cathedral at Milan was founded in 1386, is built of white marble in the form of a Latin cross: length, 485 feet; breadth of body, 252 feet; between walls of transept, 287 feet; height from pavement to top of statue of the Virgin, 355 feet. The cathedral at Florence, begun about 1294, finished about 1444, is one of the finest specimens of Italian-Gothic style: length. 387 feet; transept, 334 feet; height of nave, 153 feet. The Cologne Cathedral, commenced in 1248, recently finished: length 511 feet; breadth, 231 feet; height of towers, 520 feet Notre Dame, at Paris (begun 1163, finished 1312), is 390 feet long; transept, 144 feet; height of western towers, 204 feet. The other notable French cathedrals are those of Amiens, Chartres, and Rheims. St. Paul's, London, commenced by Sir Christopher Wren in 1675, finished in 1711, is about 500 feet long; transept, 285 feet; the dome is 145 feet diameter, and 365 feet from the ground. There are a great many other cathedrals in England, some of them furnishing noble specimens of architecture. We may mention more particularly those of Canterbury, Ely, Exeter, Lichfield, Lincoln, Norwich, Salisbury, Wells, Westminster, and York. (See the articles on the different towns.) The cathedrals of Glasgow and Kirkwall are the only complete and entire cathedrals in Scotland, exclusive of modern edifices so called.

CATHELINEAU, JACQUES, one of the most celebrated leaders in the war of La Vendée, born at Pin-en-Mauge in Anjou, in 1759, was successively a mason, a carrier, and a pedlar. On the breaking out of the French revolution he was living quietly with his family, when an unforeseen event suddenly called him forth from obscurity. In March 1793, during the levy of the conscription which the national assembly had decreed, the youth of the district of St. Florent rose in insurrection, and put the officials and *gens d'armes* to flight. They then returned home, and were awaiting the terrible revenge of the Republicans, when news of the outbreak reached Cathelineau, as he was kneading cakes for the family consumption. He instantly determined to put himself at the head of his countrymen. Wiping his naked arms and putting on his coat, he assembled the villagers, and by his fiery eloquence roused them to open resistance. He was at first joined only by twenty-seven persons, but causing the alarum-bell to be rung in different places, he was soon followed by almost all the men capable of bearing arms, surprised several republican posts, carried off their cannon, and now mustered several thousand strong. As he did not deem himself equal to the post of commander, he placed himself under Bonchamp and Elbée, but after the victory of Saumur, 9th June, 1793, was formally invested as commander-in-chief. On this he resolved to make a decisive attack on Nantes, and appeared before it with 80,000 men, still further increased by 30,000 whom Charette brought from Lower Poitou. Notwithstanding these vast numbers, and the greatest display of undisciplined gallantry, the attack was repulsed, and Cathelineau died shortly after of the severe wounds which he had received. His numerous children almost all perished during the war, but the surviving members were rewarded with large pensions at the restoration of the Bourbons.

CATHERINE. See CATHARINE.

CATHERINE'S, ST., or ILHA SANTA CATHARINA, an island close to the coast of Brazil, between lat. 27° and 28° s., and belonging to the province or state of Santa Catharina. It is 37 m. long and 10 broad, and contains Desterro, the state capital.

CATHETER, a term applied in surgery to a tube which is introduced into the bladder through the urethra, for the purpose of drawing off the urine when it cannot be discharged in the natural way; sometimes also in other cases. Catheters were anciently made of copper, but silver is the substance now generally used, though flexible catheters of gum-elastic are also frequently employed. A different form and size of catheter is, of course, required for the male from what is required for the female.

CATHOLIC APOSTOLIC CHURCH. See IRVINGITES.

CATHOLIC CHURCH. See ROMAN CATHOLIC CHURCH.

CATHOLIC EMANCIPATION. By Catholic emancipation is understood the abolition of those civil and ecclesiastical restraints to which the Catholics of Great Britain, and particularly of Ireland, were once subjected. The Catholic inhabitants of that country were excluded from public offices, and from all participation in the choice of members of Parliament. None but the Anglo-Irish, belonging to the Episcopal Church, which had now become the established church in Ireland—men who possessed the greatest part of the landed property, that had been torn from the original inhabitants—were eligible to public offices, or to a seat in Parliament. In this oppressed condition the Irish Catholics remained till 1793. The revolutionary ideas of that time aroused a desire among the Irish Catholics for equal rights with their Protestant fellow-countrymen. They were supported in England itself by a very respectable party. Burke repeatedly spoke in Parliament in favour of their emancipation. In 1792 they presented a petition, praying for the abolition of all the restrictions to which they had hitherto been subjected, and in 1793 the *Irish Act*, so called, was passed which conferred the elective franchise on the Catholics, threw open to them all employments in the army in Ireland, and all offices in the navy. Three offices in the army only were excepted—those of the commander-in-chief, master-general of the ordnance, and generals on the staff. They continued to be excluded, however, from thirty public offices, and from Parliament—an arrangement which could not be changed without a repeal of the Corporation and Test Acts (which see). A part of the Irish Catholics were satisfied with the concessions. Another party, however, encouraged by a few noblemen who had entered into connection with France, cherished the hope that Ireland would succeed, with the help of France, in freeing itself from the British power. An insurrection speedily broke out, which was quelled by the severity of the governor, Lord Camden, but it blazed forth again in 1798. By this rebellion judicious men both in England and Ireland were convinced that, as long as the two kingdoms had separate legislatures, and that of the weaker was dependent on that of the stronger, and the inhabitants of the two kingdoms thought their interests inconsistent, jealousy and distrust would continue. The Anglo-Irish also, who at first supported the rebellion, perceived that the superior numbers of the Catholics, and their bitter enmity to the Protestants, would make the separation of Ireland from Britain a great misfortune. It was resolved, then, to unite Ireland with Britain; and the union was effected, the first united Parliament being opened on January 22, 1801. In regard to ecclesiastical affairs, nothing further was provided in the act of union than that the Episcopal Church in Ireland should remain the Established Church, and should constitute one church with that of England. Respecting the condition of the Catholics nothing was done, and Pitt observed that it would be well to reserve this business for future deliberation. The united Parliament had been in session but a few days when reports were spread which gave occasion for much anxiety. The Catholics in Ireland, it was said, complained of the non-fulfilment of expectations which had been held out to them to make them favourable to the union. Full emancipation had been promised them, as a certain consequence of it. Pitt, the author of the union, had pledged himself, with his colleagues, to promote the fulfilment of this wish of the Catholics, and had encouraged hopes with the expectation of being able to fulfil them. For this reason they endeavoured, after the union was completed, to obtain an act of Parliament by which admission to Parliament and to offices of state, from which the Catholics were still excluded, should be made possible for a certain number of them by dispensing with the test-oath. But the king set himself against this measure, as being inconsistent with his coronation-oath. Pitt and his colleagues, therefore, in 1801, resigned their places. Pitt foresaw that, if both houses agreed to this measure, the king would still withhold his permission; and thus the discontent of the Catholics would be directed against the person of the king himself. This he wished by all means to avert; and on this ground, in 1805, he spoke against the emancipation, when the opposition proposed anew to grant the Catholics a seat and a voice in Parliament, and admissibility to all offices of state. During later years the petition for complete emancipation was several times renewed in vain. In 1822, on the motion of Mr. Canning, a bill was passed in the House of Commons by a majority of twenty-one voices, enabling Catholic peers to sit in Parliament; but in the House of Lords the bill was rejected. The same happened in 1825, when the Duke of York, who died in 1827, solemnly opposed it. In 1827, under Canning's administration, the motion for emancipation was lost in the House of Commons by a majority of three. The measure was at last effected under the administration of the Duke of Wellington. The disturbances in Ireland were assuming continually a more organized character under the influence of the Catholic Association, which was spread through the country, and directed by men of great abilities—such as O'Connell and Shiel—so that the duke was at last driven to support the cause of the Catholics. Peel, who had formerly spoken warmly against emancipation, now moved it in the House of Commons. The bill received the royal assent on April 13, 1829.

The emancipation of the Catholics is so interesting an event, that the following abstract of the fate of various motions respecting it may not be unacceptable to our readers. In the year 1805 a majority of 129 in the House of Lords, and of 212 in the House of Commons, refused to act on the petition of the Catholics, moved severally by Lord Grenville and Mr. Fox. In 1807 Lord Grenville withdrew his motion in favour of emancipation, it being understood that his majesty was averse to it. In 1808 Mr. Grattan's motion was rejected in the House of Commons by a majority of 153, and Lord Donoughmore's, in the House of Lords, by a majority of eighty-seven. In 1810 a motion to the same effect, by the same members, was again lost by a majority of 112 in the Commons, and eighty-six in the Lords. In 1812 there was a majority of seventy-two in the Lords, and eighty-five in the Commons against the movers. Mr. Canning's motion was lost in the same year by a majority of 129 in the Commons, and that of the Marquis of Wellesley by a majority of 113 in the Lords. In 1813 the motions of Mr. Grattan, Sir John Cox Hippesley, and Dr. Duigenan drew forth majorities against the Catholics of forty, forty-eight, and forty-two, and on the 24th of May the bill was given up. In 1821 Mr. Plunkett carried the bill through the House of Commons by a majority of nineteen; but it was lost in the Lords by a majority of thirty-nine. In 1822 Mr. Canning carried it in the Commons by a majority of twenty-one; but it was thrown out in the Lords by a majority of forty-two. In 1825 Sir Francis Burdett carried it in the Commons by a majority of twenty-seven; but it was again thrown out in the Lords by a majority of forty-eight. In 1827 Sir Francis Burdett's motion for a committee was lost in the Commons by a majority of three. In 1828 the motion for a conference with the Lords was carried in the Commons by a majority of six; but thrown out in the Lords by a majority of forty-five. And in 1829 (April 10) a *relief bill*, abolishing the civil disabilities of Roman Catholics by repealing the oaths of supremacy, &c., was carried through the Commons by Mr. Peel, with a majority of 180 on the second reading, and 178 on the third; and through the Lords by the Duke of Wellington, with a majority of 105 on the second reading, and 104 on the third. By this bill Catholics are eligible to all offices of state, excepting the lord-chancellorships of England and Ireland, the lord-lieutenancy of Ireland, the office of regent or guardian of the United Kingdom, and that of high commissioner to the Church of Scotland. By an act passed in 1867 it was made lawful for a Roman Catholic to hold the office of Lord-chancellor of Ireland. They are still excluded from the right of presentation to livings, and all posts connected with the ecclesiastical courts. The church patronage attached to any office in the hands of a Catholic is vested in the Archbishop of Canterbury, and if the patronage of an ordinary living would fall to a Catholic, the university of Oxford or Cambridge takes his place, according to the county. Attached to the bill is a clause for the restriction of the Jesuits and monastic orders (religious establishments of females excepted).

CATHOLIC EPISTLES, a name given to seven epistles of the New Testament, because written to Christians in general, and not to believers of some particular place. They are, one of James, two of Peter, three of John, and one of Jude.

CATHOLIC MAJESTY, a title which Pope Alexander VI. gave to the kings of Spain, in memory of the complete expulsion of the Moors out of Spain in 1491 by Ferdinand of Arragon. But even before that time, and especially after the council at Toledo in 589, several Spanish kings are said to have borne this title.

CATILINE (LUCIUS SERGIUS CATILINA) was just entering on the age of manhood when Rome became a prey to the rage of Marius and Sulla. Of patrician birth, but poor, he attached himself to the cause of the latter, had some share in his success, and still more in his proscriptions. Murder, rapine, and conflagration were the first deeds and pleasures of his youth. He appears to have served in the army with reputation. Sallust, who has written the history of his conspiracy, describes him as having a constitution that could support hunger, cold, fatigue, and want of sleep, to an incredible extent; with a spirit bold, cunning, fruitful in resources; lusting after the wealth of others, prodigal of his own; a man of fiery passions, but limited judgment. Such was his art, that, while he was poisoning the minds of the Roman youth, he gained the friendship and esteem of the severe Catulus. Equally well qualified to deceive the good, to intimidate the weak, and to infuse his own boldness into his associates, he evaded two accusations brought against him by Clodius for criminal intercourse with a vestal, and for monstrous extortions, of which he had been guilty while proconsul in Africa. He was suspected also of having murdered his first wife and his son. A confederacy having been formed of many young men of high birth and daring character, who saw no other means of extricating themselves from their enormous debts than by obtaining the highest offices of the state, Catiline was placed at their head. This eminence he owed chiefly to his connection with the old soldiers of Sulla, by means of whom he kept in awe the towns near Rome, and even Rome itself. At the same time he numbered among his adherents not only the worst and lowest of the populace, but also many of the patricians, and men of consular rank. Everything favoured the audacious scheme. Pompey was pursuing the victories which Lucullus had prepared for him; and the latter was but a feeble supporter of the patriots in the senate, who wished him, but in vain, to put himself at their head. Crassus, who had delivered Italy from the gladiators, was now striving after power and riches, and countenanced the growing influence of Catiline as a means of his own aggrandizement. Cæsar, who was labouring to revive the party of Marius, spared Catiline, and perhaps even encouraged him. Only two Romans remained determined to uphold their falling country —Cato and Cicero; the latter of whom alone possessed the qualifications necessary for the task. The conspirators were now planning the elevation of Catiline and one of his accomplices to the consulship, by which they hoped to obtain possession of the public treasures and the property of the citizens under various pretexts, and especially by means of proscription. Cicero had the courage to stand candidate for the consulship: neither insults nor threats, nor even riots and attempts to assassinate him, deterred him from his purpose; and being supported by the rich citizens, he gained his election, B.C. 65. All that the party of Catiline could accomplish was the election of Caius Antonius, one of their accomplices, as colleague of Cicero. This failure, however, did not deprive Catiline of the hope of gaining the consulship the following year. For this purpose he revived the kind of terrorism by which he had laid the foundation of his power. Meanwhile, he had lost some of the most important members of his conspiracy. Antony had been prevailed upon or compelled by Cicero to remain neutral. Cæsar and Crassus had resolved to do the same. Piso had been killed in Spain. Italy, however, was destitute of troops. The veterans of Sulla only waited the signal to take up arms. This signal was now given by Catiline. The centurion Manlius appeared among them, and formed a camp in Etruria. Cicero was on the watch: a fortunate accident disclosed to him the counsels of the conspirators. One of them, Curius, was on intimate terms with a woman of doubtful reputation, Fulvia by name, and had acquainted her with their plans. Through this woman Cicero learned that L. Vargunteius, a senator, and C. Cornelius, a knight, had undertaken to assassinate him at his house. On the day which they had fixed for the execution of their plan, they found the doors barred and guarded. Still Cicero delayed to make public the circumstances of a conspiracy, the progress and resources of which he wished first to ascertain. He contented himself with warning his fellow citizens, in general terms, of the impending danger. But when the insurrection of Manlius was made known, he obtained from the senate the decree, only promulgated on occasions of the utmost importance, that 'the consuls should take care that the republic received no detriment.' It was exceedingly difficult to seize the person of one who had soldiers at his command both in and out of Rome; still more difficult would it be to prove his guilt before judges who were accomplices with him, or at least were willing to make use of his plans to serve their own interest. Cicero had to choose between two evils—a revolution within the city, or a civil war: he preferred the latter. Catiline had the boldness to take his seat in the senate, known as he was to be the enemy of the Roman state. Cicero then rose and delivered that bold oration against him, beginning, 'Quousque tandem abutêre, Catilina, patientia nostra?' (how long then, Catiline, wilt thou abuse our patience?) Assuming a confidence he did not possess, he attempted a reply, but his words were instantly drowned by the cries of 'Parricide!' and 'Traitor!' which rose on all hands. Now fully conscious that his plans were discovered, he rushed from the assembly with threats and curses on his lips: he left Rome at dead of night. The conspirators who remained, Lentulus Sura, Cethegus, and other infamous senators, engaged to head the insurrection in Rome as soon as Catiline appeared at the gates. According to Cicero and Sallust, it was the intention of the conspirators to set the city on fire, and massacre the inhabitants. At any rate, these horrid consequences might have easily followed from the circumstances of the case, without any previous resolution. Lentulus, Cethegus, and the other conspirators, in the meanwhile, were carrying on their criminal plots. They applied to the ambassadors of the Allobroges to transfer the war to the frontiers of Italy itself. These, however, revealed the plot, and their disclosures led to others still more important. The correspondence of the conspirators with their leader was intercepted. As the circumstances of the case did not allow of a minute observance of forms in the proceedings against the conspirators, the laws relating thereto were disregarded, as had been done in former instances of less pressing danger. Cæsar spoke against immediate execution, but Cicero and Cato prevailed. Five of the conspirators were put to death. Caius Antonius was then appointed to march against Catiline, but on the pretext of ill health, gave the command to his lieutenant, Petreius. He succeeded in inclosing Catiline, who, seeing no way of escape, resolved to die sword in hand. His followers imitated his example. The battle was fought with bitter desperation. The insurgents all fell on the spot which their leader had assigned them, and Catiline at their head, at Pistoia, in Etruria, 5th Jan., B.C. 62.

CATINAT, NICHOLAS, Marshal of France, was born at Paris, 1637. He quitted the profession of the law for that of arms, and attracted the notice of Louis XIV. at the storming of Lille (1667), and was promoted. By a number of splendid deeds he gained the esteem and friendship of the great Condé, particularly by his conduct at the battle of Senef. He was sent as lieutenant-general against the Duke of Savoy, gained the battles of Staffardo (Aug. 18, 1690) and of Marsaglia (Oct. 4, 1693), occupied Savoy and part of Piedmont, and was made marshal in 1693. In the conquered countries his humanity and mildness often led him to spare the vanquished, contrary to the express commands of Louvois. In Flanders he displayed the same activity, and took Ath in 1697. In 1701 he received the command of the army of Italy against Prince Eugene; but he was straitened by the orders of his court, and was destitute of money and provisions, while Eugene was allowed to act with full liberty. July 6th, he was defeated at Carpi. Equally unfortunate was the battle of Chiari, where Villeroi had the chief command. It was here, while rallying his troops after an unsuccessful charge, that he replied to an officer who represented to him that death was inevitable in such an encounter, 'True, death is before us, but shame behind.' In spite of his representations the French court would not believe the disasters in Savoy to be owing to the perfidy of the Duke of Savoy, and Catinat was disgraced. He bore his misfortune with calmness, and died at St. Gratien in 1712. He was a true philosopher, religious without austerity, a courtier without intrigue, disinterested and generous when in favour, and cheerful in disgrace. From his unalterable calmness and consideration his soldiers called him *le Père la Pensée*.

CAT ISLAND, one of the Bahama Islands, about 46 miles in length from N. to S., and 3 to 7 in its mean breadth. Pop. 3000. This island was long identified with the Guanahani of Columbus, the first portion of land belonging to the New World on which he landed, Oct. 12, 1492. It is now thought by most that not this island but Watling Island, lying a little to the S.E., is the true Guanahani of Columbus.

CATMANDOO. See KHATMANDU.

CATO, MARCUS PORCIUS (called, to distinguish him from the censor, his great grandfather, *Cato of Utica*, the place of his death), was born 95 B.C. He formed an intimacy with the Stoic Antipater, of Tyre, and ever remained true to the principles of the Stoic philosophy. His first appearance in public was against the tribunes of the people, who wished to pull down a *basilica* erected by the censor Cato, which was in their way. On this occasion he displayed that powerful eloquence which afterwards rendered him so formidable, and won the cause. He served his first campaign as a volunteer in the war against Spartacus, and highly distinguished himself. He served as military tribune in Macedonia in B.C. 67. When the term of his office had expired he travelled into Asia, and brought back the Stoic Athenodorus with him to Rome. He was next made quæstor (B.C. 65), and executed his difficult trust with the strictest integrity, while he had the spirit to prosecute the public officers for their acts of extortion and violence. His conduct gained him the admiration and love of the Romans, so that, on the last day of his quæstorship, he was escorted to his house by the whole assembly of the people. The fame of his virtue spread far and wide. In the games of Flora the dancing-girls were not allowed to lay aside their garments as long as Cato was present. The troubles of the state did not permit him to remain in seclusion. The example of Sulla in usurping supreme power was followed by many ambitious men, whose mutual dissensions were all that saved the tottering constitution from immediate ruin. Crassus hoped to purchase the sovereignty with his gold; Pompey expected that it would be voluntarily conferred upon him; and Cæsar, superior to both in talent, united himself to both, and made use of the wealth of the one and the reputation of the other to attain his own objects. Cato, keeping aloof from all parties, served the commonwealth with sagacity and courage; but he often injured the cause which he was trying to benefit by the inflexibility of his character. In B.C. 63 he was chosen tribune of the people. About this time the conspiracy of Catiline broke out. Cato supported Cicero, who was then consul, with all his power, first gave him publicly the name of *father of his country*, and urged, in a fine speech preserved by Sallust, the rigorous punishment of the traitors. He opposed the proposition of Metellus Nepos to recall Pompey from Asia, and give him the command against Catiline, and very nearly lost his life in a riot excited against him on this account by his colleague and Cæsar. After the return of Pompey he frustrated many of his ambitious plans, and first predicted the consequences of his union with Crassus and Cæsar. The triumvirate, in order to remove him to a distance, had him sent to Cyprus, of which he took possession on behalf of Rome (58–57). He was compelled to obey, and executed his commission with so much address that he enriched the treasury with a larger sum than had ever been deposited in it by any private man. In the meantime he continued his opposition to the triumvirate. Endeavouring to prevent the passage of the Tribonian law, for investing the triumvirs with extraordinary powers, he was drawn into tumults, and even personal conflict. Being afterwards made prætor (54 B.C.), he carried into execution a law against bribery that displeased all parties. After the death of Crassus the civil commotions increased, and Cato, as the only means of preventing greater evils, proposed that Pompey should be made sole consul, contrary to the constitution, which proposition was adopted. The year following (B.C. 51) Cato lost the consulship by not submitting to employ the necessary amount of bribery to procure a majority. Soon after (B.C. 49) the civil war broke out. Cato, then proprætor in Sicily, on the arrival of Curio with three of Cæsar's legions, departed for the camp of Pompey, at Dyrrachium. He had always hoped to prevent the war by negotiation; and when it broke out he put on mourning in token of his grief. Pompey, having been victorious at Dyrrachium, left Cato behind to guard the military chest and magazine, while he pushed after his rival. For this reason Cato was not present at the battle of Pharsalia, after which he sailed over with his troops to Cyrene, in Africa. Here he learned that Pompey's father-in-law, Scipio Metellus, had gone to Juba, king of Mauritania, where Varus had collected a considerable force. Cato immediately set off to join him, and after undergoing hunger, thirst, and every hardship, reached Utica, where the two armies effected a junction (B.C. 47). The soldiers wished him to be their general, but he gave this office to Scipio, and took the command in Utica, while Scipio and Labienus sallied out against Cæsar. Cato had advised them to protract the war, but they ventured an engagement, in which they were entirely defeated, and Africa submitted to the victor. Cato had at first determined to defend himself to the last, with the senators in the place; but he afterwards abandoned this plan, and despairing of the commonwealth, and unwilling to live under the despotism of Cæsar, he resolved to die. On the evening before the day which he had fixed upon for executing his resolution, he took a tranquil meal, and discussed various philosophical subjects. He then retired to his chamber, and read the Phædo of Plato. Anticipating his intentions, his friends had taken away his sword. On finding that it was gone he called his slaves, and demanded it with apparent equanimity; but when they still delayed to bring it he struck one of the slaves who was endeavouring to pacify him. His son and his friends came with tears, and besought him to refrain from his purpose. At first he reproached his son for disobedience, then calmly advised those present to submit to Cæsar, and dismissed all but the philosophers Demetrius and Apollonius, whom he asked if they knew any way by which he could continue to live without being false to his principles. They were silent, and left him, weeping. He then received his sword joyfully, again read Phædo, slept a while, and on awaking sent to the port to inquire if his friends had departed. He heard with a sigh that the sea was tempestuous. He had again sunk into slumber, when word was brought him that the sea was calm, and that all was tranquil in the harbour. He appeared satisfied, and the moment he was alone stabbed himself with his sword. His people rushed in, and taking advantage of a swoon into which he had fallen, bound up his wounds; but, on coming to himself, he tore off the bandages and expired (46 B.C.) The Uticans buried him honourably, and erected a statue to him. Cæsar, when he heard the news of his death, exclaimed, 'I grudge thee thy death, since thou hast grudged me the honour of sparing thy life.'

CATOPTRICS (from Greek *katoptron*, a mirror), a science which treats of reflected light. See Optics.

CATO THE CENSOR, Marcus Porcius, surnamed *Priscus*, also *Sapiens* and *Major* (the Wise and the Elder), was born 234 B.C. at Tusculum, and inherited from his father, a plebeian, a small estate in the territory of the Sabines, which he cultivated with his own hands. He was a youth at the time of Hannibal's invasion of Italy. He served his first campaign, at the age of seventeen, under Fabius Maximus, when he besieged Capua. Five years after he fought under the same commander at the siege of Tarentum. After the capture of this city he became acquainted with the Pythagorean Nearchus, who initiated him into the sublime doctrines of his philosophy, with which, in practice, he was already conversant. After the war was ended Cato returned to his farm. As he was versed in the laws, and a fluent speaker, he went at daybreak to the neighbouring towns, where he acted as counsellor and advocate to those who applied to him. Valerius Flaccus, a noble and powerful Roman, who had an estate in the vicinity, observed the talents and virtue of the youth, conceived an affection for him, and persuaded him to remove to Rome, where he promised to assist him with his influence and patronage. A few rich and high-born families then stood at the head of the republic. Cato was poor and unknown; but his eloquence, which some compared to that of Demosthenes, and the integrity and strength of his character, soon drew the public attention to him. In the forum and the popular assemblies he realized the fine definition which he himself gave of an orator, and which Quinctilian has preserved to us: 'A virtuous man skilled in the art of speaking well.' At the age of thirty he went as military tribune to Sicily. In the following year he was quæstor, at which period there commenced between him and Scipio a rivalry and hatred which lasted till death. Cato, who had returned to Rome, accused Scipio of extravagance; and though his rival was acquitted of the charge, this zeal in the cause of the public gave Cato a great influence over the people. Five years after, having been already ædile, he was chosen prætor, and obtained the province of Sardinia. His strict moderation, integrity, and love of justice, were here still more strongly displayed than in Rome. On this island he formed an acquaintance with the poet Ennius, of whom he learned Greek, and whom he took with him to Rome on his return. He was finally made consul, 192 B.C., and had his friend Valerius Flaccus for colleague. He opposed, with all his power, the abolition of the Oppian law, passed in the pressing times of the second Punic war, forbidding the Roman women to wear more than half an ounce of gold, to dress in garments of various colours, or to wear other ornaments; but he was obliged to yield to the eloquence of the tribune Valerius, and still more potent female importunities. Soon after he set out for Spain, which was in a state of rebellion. His first act was to send back to Rome the supplies which had been provided for the army, declaring that the war ought to support the soldiers. He gained several victories with a newly-raised army, reduced the province to submission, and returned to Italy, where the honour of a triumph was granted to him. Scarcely had he descended from his triumphal car when he put off the toga of the consul, arrayed himself in the soldier's habit, and followed Sempronius to Thrace. He afterwards put himself under the command of the Consul Manius Acilius, to fight against Antiochus, and to carry on the war in Thessaly. By a bold march he made himself master of the Callidromus, one of the highest peaks of the mountain pass of Thermopylæ, and thus decided the issue of the battle. He brought the intelligence of this victory to Rome, 189 B.C. Five years after, in spite of a powerful faction opposed to him, he obtained the most honourable, and at the same time the most feared, of all the magistracies of Rome, the censorship. He had not canvassed for the office, but had only expressed his willingness to fill it. In compliance with his wishes Valerius Flaccus was chosen his colleague, as the only person qualified to assist him in correcting the public disorders, and restoring the ancient purity of morals. He fulfilled this trust with inflexible rigour; and though his measures caused him some obloquy and opposition, they met, in the end, with the highest applause; and when he resigned his office, it was resolved to erect a statue to him with an honourable inscription. He appears to have been quite indifferent to the honour; and when, before this, some one expressed his wonder that no statue had been erected to him, he answered, 'I would rather have it asked why no image has been erected to Cato than why one has.' Still he was not void of self-complacency. 'Is he a Cato, then?' he was accustomed to say, when he would excuse the errors of another. Cato's political life was a continued warfare. He was continually accusing, and was himself accused with animosity, but was always acquitted. His last public commission was an embassy to Carthage to settle the dispute between the Carthaginians and King Massinissa. It is said that this journey was the original cause of the destruction of Carthage; for Cato was so astonished at the rapid recovery of this city from its losses, that he ever after ended every speech of his with the well-known words, 'Præterea censeo, Carthaginem esse delendam' (I am also of opinion that Carthage must be destroyed). He died a year after his return (149 B.C.), eighty-five years old. Cato, who was so frugal of the public revenues, was not indifferent to riches. He was rigorously severe towards his slaves, and considered them quite in the light of property. He made every exertion to promote and improve agriculture. In his old age he gave himself up to the company of his friends and the pleasures of the table. To this the verses of Horace allude—

> Narratur et prisci Catonis
> Sæpe mero caluisse virtus.

He was twice married, and had a son by each of his wives. His conduct as a husband and a father was equally exemplary. He composed a multitude of works, of which the only one extant is that De Re Rustica. Those of which the loss is most to be regretted are his orations, which Cicero mentions in terms of the highest encomium, and his history of the origin of the Roman people, which is frequently quoted by the old historians.

CATRINE, a small town of Scotland, pleasantly situated on the northern bank of the river Ayr, about 14 miles from Ayr. It was built in 1787 by Mr. Alexander of Ballochmyle, and Mr. David Dale of Glasgow, for the accommodation of the workers employed in the extensive cotton factories erected there. The principal buildings besides the Established, Free, E.U., and U.P. churches are the Wilson Bequest Hall (1880), and the two public schools. Population in 1881, 2638; in 1891, 2458.

CATS, JACOB, born in 1577, at Brouwershaven, in Zealand, one of the fathers of the Dutch language and poetry. He studied at Leyden, Orleans, and Paris. In 1627 and 1631 he was ambassador to England, and in 1636 grand pensioner of Holland. His poetry is distinguished for simplicity, *naïveté*, richness of imagination, and winning though unpretending morality. His works consist of allegories, according to the taste of his times, poems on the different ages and situations of life, idyls, &c. He died in 1660.

CAT'S-EYE. See ASTERIA.

CATSKILL MOUNTAINS, a range of mountains in New York state. They lie on the W. side of and nearly parallel to the Hudson, from which their base is, at the nearest point, 8 miles distant. The two most elevated peaks are Round Top and High Peak; the former being 3804 feet, the latter 3718 feet high. The Catskill Mountains present scenery of singular beauty and grandeur, and have become a noted resort of travellers during the summer. On the Kaaterskill, a stream which is supplied by two small lakes situated high in the mountains, are two fine cascades. The upper fall is 120 feet in height; and a few rods below is the other, of 80 feet, both perpendicular. The stream passes into a deep and very picturesque ravine, which is bordered by mountains rising abruptly 1000 or 1500 feet.

CATSUP. See KETCHUP.

CATTARO, a seaport of Austria, in Dalmatia, at the bottom of the Gulf of Cattaro, on the E. side of the Adriatic, 38 miles S.E. Ragusa. It lies at the foot of steep limestone rocks, strongly fortified and surmounted by a castle, and is surrounded with walls. The buildings are in the Venetian style, and the streets are narrow, irregular, and dark. It is the seat of a Roman Catholic bishop, and the cathedral is a well-built edifice. The harbour is spacious, but there is not much trade. Pop. (1890). 5432.

CATTEGAT, a large gulf of the North Sea, between North Jutland to the W., Sweden to the E., and the Danish islands of Zealand, Funen, &c., to the S.; about 150 miles from N. to S., and its greatest breadth about 90. It is difficult of navigation, being not only shallow towards the shores, and irregular in depth, but obstructed by several sand-banks, and the adverse winds which often prevail here increase the danger. The Cattegat is noted for its herring-fishery. It contains the islands Samsöe, Anholt, Lessöe, and Hertzholm.

CATTERMOLE, GEORGE, an eminent water-colour painter, was born, 1800, at Dickleburgh, near Diss, Norfolk. Like Turner and William Hunt, he started in life as a topographical draughtsman. He was employed as a draughtsman on Britton's English Cathedrals when only sixteen. He drew the designs for the illustrations of various annuals, the Waverley Novels, for an edition of Shakspeare, and for his brother's History of the Civil Wars. In 1833 he was elected a member of the Society of Painters in Water-colours. He was a member also of the Academy at Amsterdam, and of the Belgian Society of Water-colour Painters. He obtained a medal of the first-class at the Paris Exhibition of 1855. In 1851 he resigned his membership of the English Society, and devoted himself to oil-painting. Among the best known of his pictures are Hamilton of Bothwellhaugh about to shoot the Regent Murray, Luther at the Diet of Spires, The Armourer's Tale, &c. He died 24th July, 1868.

CATTI, one of the most renowned and valiant German tribes. They inhabited what is now Hesse, also part of Franconia and Westphalia. They carried on bloody wars with the Hermunduri and Cherusci. In the time of Cæsar they dwelt on the Lahn, and opposed him with effect. Drusus defeated without reducing them. In the reign of Marcus Aurelius they made incursions into Germany and Thrace, but were afterwards defeated by Didius Julianus. In 392 they made their last appearance in history in union with the Franks. According to Cæsar, their territory was divided into 100 districts, each of which was obliged to send annually 1000 men into the field, whose place was supplied the following year by those who had before remained at home to cultivate the ground. Their food was milk, cheese, and game; their dress the skins of animals. Their limited princes, who governed in connection with a diet, annually distributed the lands among the families. See GERMANY.

CATULLUS, VALERIUS (whose prænomen is stated by some to be Caius, by others Quintus), a famous Roman poet, born B.C. 86, at Verona (according to some, at Sirmium, a small town on a peninsula of Lake Benacus, now Lago di Garda), of rich and respectable parents, went in his youth to Rome, where his accomplishments soon won him the favour of those who adorned that splendid era. He was the friend of Cicero, of Plancus, Cinna, and Cornelius Nepos; to the last he subsequently dedicated the collection of his poems. This collection is not of great extent, but shows what he was capable of doing in several kinds of poetry, had he preferred a steady course of study to pleasure and travelling. Probably a part of his poems have not come down to us. Of the merit of his productions there has been but one opinion among the ancients as well as moderns. Tibullus and Ovid eulogize him; and Martial, in one of his epigrams, grants to him alone a superiority over himself. In sportive composition and in epigrams, when he keeps within the proper limits of that species of poetry, he is a model. He succeeded also in heroic verse, as in his beautiful episode of Ariadne, which appears to have inspired the poet who afterwards sung of Dido. He was the first of the Romans who successfully imitated the Greek lyric poetry. The four odes of his that remain to us make us feel a lively regret for the loss of the others. A weighty objection, however, against most of his writings, is their licentiousness and indelicacy. The common opinion is that he died 57 B.C., in the thirtieth year of his age, but this is no doubt erroneous, as there are allusions in his own works which prove him to have been alive in the consulship of Vatinius, as late as 47 B.C. Scaliger maintains, but without sufficient proof, that he died in his seventy-first year. An excellent English translation of Catullus in the original metres is that of Professor Robinson Ellis, who has also published an admirable annotated edition of the Latin text.

CAUBUL. See CABUL.

CAUCASIAN RACE, a term introduced into ethnology by Blumenbach, in whose classification of mankind it was applied to one of the five great races into which all the different nations of the world were divided. Blumenbach believed this to be the original race from which the others were derived, and he gave it the epithet of Caucasian because he believed that its most typical form—which was also that of man in his highest physical perfection—was to be met with among the mountaineers of the Caucasus. The physical superiority of these peoples is scarcely maintained at the present day, but the name is still retained in classifications. The Caucasian race comprises the most highly civilized nations of the world, including most of the inhabitants of Europe (the Turks, Hungarians, and Fins being excluded); the Hindus, Persians, Arabs, Hebrews, and the ancient Phœnicians of Asia; and a large proportion of the inhabitants of Northern Africa. See ETHNOLOGY.

CAUCASUS, a chain of mountains between Europe and Asia, extending from S.E. to N.W., and occupying the isthmus between the Black and Caspian Seas. The length is computed at 700 miles, the breadth is various; from Mosdok to Tiflis it may be estimated at 184 miles. Torrents, precipices, and avalanches render these mountains difficult to cross. The Caucasus is divided into several parallel chains. The central ridge, from which the mountains fall off on each side, consists of granitoid syenite. The summits are covered with snow and ice; the lower parts are clothed with forests. According to the most recent measurements the heights of the four chief summits of the Caucasus are as follows:—Elbruz, 18,572 feet; Koshtan-tau, 17,123; Dych-tau, 16,928; Kasbek, 16,546. Those mountains, as they lie north of the Caucasian watershed, are to be looked upon as European. Elbruz and Kasbek were ascended to their summits for the first time by Messrs. Freshfield, Moore, and Tucker, in 1868. The limit of perpetual snow on the Caucasus varies from 9500 feet to 12,500 feet. It is higher on the northern slope than on the southern, the difference often amounting to more than 1000 feet. Two of the passes, or *gates*, as they are often called, are remarkable—the Caucasian Pass, and the Albanian or Caspian Pass. Most of the rivers, which take their rise in the Caucasus, flow in an easterly direction to the Caspian Sea, or in a westerly course to the Black Sea. On the northern declivity the Terek flows easterly into the Caspian, and the Kuban westerly into the Black Sea; beyond these rivers the mountain chain sinks down by degrees to the sandy plains in the south of Russia. On the southern declivity the Kur flows easterly into the Caspian, and the Rion (called by the ancients the *Phasis*) westerly into the Black Sea. Beyond these rivers rise the mountains of Turkish and Persian Armenia, which connect the Caucasus with the other chains of Western Asia. The highest ridge of the Caucasian chain is rugged and barren, but part of the southern declivity is extremely fruitful. In many parts the country abounds with forests, and on the low grounds there are often orchards and vineyards, corn-fields and pastures, in rich alternation. Grapes and various kinds of fleshy fruits, chestnuts and figs, grow spontaneously. Grain of every description, rice, cotton, and hemp, flourish abundantly. But agriculture can be carried on with success in a comparatively limited area, much of this region being too mountainous, while in many localities there is a deficiency of water. The agricultural implements are mostly of the simplest and rudest character. Silkworms are reared in various districts, and considerable quantities of raw silk produced. Manufacturing industries are of little importance, though weapons and other articles in metal, carpets and other textiles may be mentioned. The mineral kingdom is represented by various valuable minerals, including coal, salt, sulphur, lead, iron, manganese, copper, &c., which are worked to a greater or less extent. The most celebrated mineral production of this region, however, is petroleum, which is obtained in immense quantities from the wells of Baku (See BAKU, PETROLEUM). Mineral waters abound in many districts. The trade is of importance, and is rapidly increasing, the chief centres being Baku, Tiflis, Batoum, Poti, and Novorossisk. The exports are chiefly petroleum, grain, wool, silk, cotton; the imports, textile goods of cotton, wool, and silk, metal goods, &c. For internal communication much has been done in recent times by the construction of roads; while two main lines of railway now cross the country from north-west to south-east, the one on the north side of the Caucasus chain, the other on the south (from Poti to Baku).

The original inhabitants consist of tribes of various origin and language—Georgians, Abassians, Lesghians, Ossetes, Circassians, Khists, Ingooshes, Charabulaks, Tshetshenzes, with Tartars, Armenians, Jews, and, in some parts, wandering Arabs. Some are Greek and Armenian Christians, others are Mohammedans, others Jews, and a small number heathens. Many of the tribes are distinguished for the beauty, symmetry, and strength of their frames, particularly the Circassians and Georgians. Formerly the country was very unsettled owing to the wars between the petty princes who ruled over the mountaineers, but Russian rule has put an end to this.

The Russian government of the Caucasus embraces a large area on both sides of the main range of the Caucasus. Russia claimed the greater part of the Caucasian countries from 1813; but from the bold resistance which the inhabitants offered, and the natural strength of their mountain fastnesses, it was long before these regions were brought completely under Russian rule. The capture of Shamyl, the chief of the Lesghians, in 1859, may almost be said to have terminated the resistance of the mountaineers; although several petty tribes continued the hopeless struggle up to 1864. Considerable numbers of the inhabitants had emigrated before, being discontented with the Russian rule; and now many more left their homes for the purpose of settling in Turkish territory. From the want of sufficient transport and means to receive the multitude of emigrants, they suffered great hardships, and many of them died from disease and exposure. The whole of Caucasia is under the rule of a governor-general, with a number of governors under him. It is divided into Cis-Caucasia and Trans-Caucasia, nearly equal in size, and together covering 180,850 square miles. The population of the former is returned at 3,081,762; of the latter, at 5,074,614: total, 8,156,376. The whole is now divided as follows:—Cis-Caucasia comprehends the territory of the Kuban, the government of Stavropol, and the Ter province. Trans-Caucasia comprises the government of Tiflis, the government of Kutaïs, the government of Elisabethpol, the government of Baku, the government of Erivan, and the provinces of Daghestan and Kars. The Russians number about 2,200,000; the Turks and Tartars 1,458,000; the Georgians and allied peoples 1,200,000; the Armenians 975,000; the Lesghians 614,000. The districts south of the Caucasus are still known also as Georgia or Grusia, Mingrelia, &c., while Circassia comprehends a large portion of the north and part of the south slope of the range. See Circassia.

CAUCUS, an American term used throughout the United States for those meetings which are held by the different political parties for the purpose of agreeing upon candidates for office, or concerting any measure which they intend to carry at subsequent public meetings. From the fact that such meetings were first held in a part of Boston 'where all the ship-business was carried on,' it has been inferred that *caucus* might be a corruption of *caulkers*', the word *meeting* being understood; but a more plausible derivation of the word is from *Kaw-Kaw-wus*, an Algonkin word signifying a counsellor, and in the plural counsellors or a council.

CAULAINCOURT. See Vicenza.

CAULIFLOWER (*Brassica oleracea botrytis*), the most delicate variety of the cabbage tribe. It was first brought into England from Cyprus, at what date is unknown, but it was certainly cultivated, though as a rarity, in the beginning of the seventeenth century. By the end of the following century its cultivation had become so extensive that English cauliflower was exported into Holland, Germany, and France. This vegetable is grown now pretty generally over the whole island, but as it requires a richer soil and as much space as the cabbage, while the portion of the plant used as food is much less, it can never become so cheap an esculent. It is first raised in a seed-bed of light earth, and afterwards transplanted into soil which can scarcely be too rich. The seed is sown in the end of February, May, and August, for three succeeding crops. The plants sown in the latter month stand through the winter, usually protected during cold weather under hand-glasses. The head of the cauliflower may be preserved from putrefaction for a long time by simply drawing up the plant entire, and hanging them in a cellar. In Scotland the plan usually adopted is to place the plants in layers in a pit, their heads inclining downwards. The pit is then covered closely up with earth, beaten down, and smoothed in a sloping direction, so as to exclude both the rain and atmosphere.

CAULKING, or Cauking, of a ship consists in driving a quantity of oakum or old ropes untwisted and drawn asunder into the seams of the planks, or into the intervals where the planks are joined together, in the ship's decks or sides, in order to prevent the entrance of water. After the oakum is driven very hard into these seams it is covered with hot melted pitch, to keep the water from rotting it.

CAUSE. To give a satisfactory notion of all the senses in which this word has been used it would be necessary to review all the teachings of metaphysics from the time of Aristotle downwards. The various positions of the conflicting philosophers can here be only very briefly indicated. Aristotle states causes to be of four kinds:—efficient, formal, material, and final. The efficient is the force or agency by which a result or effect is produced; the formal the means or instrument by which it is produced; the material, the substance from which it is produced; the final, the purpose or end for which it is produced. A scientific cause demands the recognition of all the essential conditions, any one of which being absent the effect could not take place. Locke finds the origin of the notion of cause in sensation. Assuming that bodies have the property of modifying each other, it is only necessary to observe them to perceive and be driven to admit the principle of causality. Hume declares the power which we attribute to one object over another to be a chimera; such a power does not exist, or if it does we can have no idea of it. What we call cause and effect is merely two phenomena always following in the same order, and which we have fallen into the habit of associating in our minds in such a way that on perceiving the first we inevitably expect the second. According to Leibnitz there is no existence, however humble, but is a force, that is, a real cause. The notion of force is the base even of the notion of existence; all that which *is* has a certain virtuality, a certain causative power. The human soul, like all the other limited forces in this world, is but a monad isolated in itself, but yet in whose inner being the whole creation is reflected, and whose movements have been from the beginning co-ordained by Divine Wisdom with the harmonious movement of the universe. Kant's doctrine is that the notion of cause and the principle of causality certainly exist in our minds; but they are only simple forms of our understanding, or the entirely subjective conditions of thought. We are compelled by a law or a form pre-existing in our intellect to dispose all the objects our imagination represents, or all the phenomena our experience can discover, according to the relation of cause and effect; but we do not know if anything really exists, independent from our intellect, which resembles a cause, a force, or effective power. Against the doctrines of the intuitionalists it has been urged that the mere statement that the mind possesses a belief in causation proves nothing: some men believe in it, others do not, and unanimity is necessary to the establishment of a universal belief. Nay more, the mere universality of a belief is no conclusive proof of its correctness, as put in the words of the late John Stuart Mill—'A mere disposition to believe, even if supposed instinctive, is no guarantee for the truth of the thing believed. If, indeed, the belief amounted to an irresistible necessity, there would be no *use* in appealing from it, because there would be no possibility of altering it. But even then the truth of the belief would not follow: it would only follow that mankind were under a permanent necessity of believing what might possibly not be true; just as they were under a temporary necessity, quite as irresistible while it lasted—of believing that the heavens moved, and the earth stood still. The things which it has been supposed that nobody could help believing are innumerable, but no two generations would give the same catalogue of them.' The theological question of a First Cause is debated on the ground that matter of itself is inert, that spirit is active, that in order of existence one spirit or active force must be the first and uncaused cause.

CAUSTIC. The name of *caustic* (Latin *causticus*, from Greek *kaiō*, I burn) is given to substances which by their chemical action disorganize the parts of the body with which they are put in contact. They are called likewise *potential cauteries*, to distinguish them from the fire, called *actual cautery*. Caustics in general act by decomposing chemically the tissues to which they are applied, by depriving them of life, and producing a real local and circumscribed gangrene, called *eschar* or *slough*. Those, the action of which is powerful—for instance, caustic potassa, concentrated sulphuric acid, &c.—produce these phenomena with such rapidity that inflammation takes place only after the formation of the *eschar;* whilst on the contrary inflammation is the immediate consequence of the less energetic caustics. In both cases suppuration occurs sooner or later, and separates the disorganized from the surrounding parts. Almost all the substances used as caustics have only a local action: some, however, are capable of being absorbed, and of exercising a deleterious action on the economy in general: arsenical preparations are an instance of it. The employment of caustics is now confined to a small number of cases. The actual cautery and the knife are in general preferred to them. They are used principally in order to establish issues, particularly in cases in which it is necessary to produce a powerful derivation; to stop the progress of certain gangrenous affections, such as *anthrax;* to open certain indolent abscesses; to change the mode of vitality of the skin in some cancerous or herpetic ulcers; to destroy the excrescences of wounds or proud flesh; and, finally, to prevent the absorption of the virus deposited at the surface of poisoned wounds.

CAUSTIC, in optics. Rays of light reflected at a concave surface, or passing through a convex lens, come generally more or less approximately to a point called the *focus*, or at any rate the rays after reflection or separation cross each other in most ordinary cases. For example, parallel rays falling on a parabolic reflector are reflected so as to pass accurately through the focus of the paraboloid: in a spherical minor parallel rays are not reflected so as to pass through any one point, but they do so nearly. (See Focus.) Geometrically defined, a *caustic surface* is the locus of the consecutive ultimate intersections of the reflected or refracted rays; and a *caustic curve* is a curve formed by the intersection of this surface with any plane surface. The curve due to reflected rays is called a *catacaustic;* that due to refracted rays is called a *diacaustic.*

The caustics formed by reflection may be easily shown in the following way. Take a strip of polished metal, a watch-spring for example; and bend it into a concave form. Let this be placed on a sheet of white paper and exposed to the sunlight so that the concave side of the spring is toward the sun: the caustic will be seen traced on the paper as a brilliant well-defined line. Let the paper be moved about, and the form of the spring varied, all the varieties of catacaustics will be beautifully displayed.

To obtain diacaustic curves, let a sheet of white paper be put into various positions behind a convex lens, through which the light from the sun is passing, the curves will be displayed in their various forms upon it.

CAUSTIC POTASSA (*potassa fusa; lapis infernalis*), impure hydrate of protoxide of potassium; caustic kali with lime; common caustic. This is seen in flat, irregular brittle pieces, or in round sticks like the nitrate of silver; of a grayish-white, sometimes reddish; of a savour extremely caustic, and a slight odour *sui generis.* This substance is extremely caustic; it decomposes quickly the parts with which it is put in contact, and leaves on the skin a soft grayish *eschar*, which comes off slowly. Taken internally it acts in the same way as all corrosive poisons; it has, nevertheless, been administered in very dilute solutions, as an antacid, diuretic, and lithontriptic. But even when very diluted, it soon irritates the stomach, and brings on anorexia, which prevents it from being used for any length of time. Pure caustic potash or hydrate of potassium is a solid white substance powerfully alkaline, which deliquesces very readily, and dissolves in water with some rise in temperature. It is very largely employed in chemistry and the arts. See Potash.

CAUSTIC SODA, hydroxide of sodium. See Soda. Its physical properties are similar to those of caustic potassa (see above), and it may be used with advantage as a substitute by way of caustic. In fact, the sub-carbonate, which forms during its action on the skin, is not deliquescent as that of potassa, and consequently is not subject to spread.

CAUTERY. See Caustic.

CAUTIONARY (Scotch law term) is the 'promise or contract of one, not for himself, but for another.' A simple cautioner is one who binds himself conjointly with the debtor or principal for the greater security of the creditor. Such a cautioner was formerly entitled to demand that the creditor should have legally proceeded against the debtor before taking action against him, but by the Mercantile Law Amendment Act the creditor may proceed against the principal debtor and cautioner, or against either of them, and he may use all action or diligence against both or either of them, which may be competent. A provision is, however, contained in the statute that the cautioner may stipulate on the document constituting the cautionary obligation that the creditor shall take legal measures against the debtor or principal. Cautioners are frequently taken bound, conjunctly and severally, or as full debtors, with the principal, in which case both parties are liable for the whole debt. When there is more than one cautioner, bound simply as such, each of them is liable, in the first instance, only for his own share, if the subject of the obligation be divisible, unless, from the insolvency of the other cautioners, the creditor cannot recover from them. It follows, from the nature of the obligation, that a cautioner who has paid the debt has an action against the principal for relief; and for this purpose he is entitled to demand an assignation from the creditor not only of the debt and legal expenses, but also of any other securities held by the creditor. A discharge of the principal is a discharge of the cautioner, and the Mercantile Law Amendment Act of 1856 enacts that a discharge of one co-cautioner by the creditor shall operate as a discharge to all the others. The fact of the creditor being negligent does not free the cautioner, unless grossly so: thus he is under no obligation to proceed against the debtor when the term of payment arrives. In cases, however, where one has become caution for the faithful performance of an office, he is free if he can prove that the employers did not exercise due vigilance over the acts of the employé. A cautioner may not withdraw suddenly from an engagement of this kind, but may do so after a reasonable notice; the obligation shall remain upon the representative of a cautioner, unless he give similar notice of withdrawal. The nature and extent of the liability must be fully stated in documents of this sort, otherwise the cautioner is not responsible. All cautionary obligations must be in writing, and have the signature of the cautioner attached; the conditions of contract must be clearly stated, which must be strictly observed, otherwise the cautioner is freed.

CAUVERY. See Cavery.

CAVA, a town, South Italy, in the province of Salerno, agreeably situate in the valley of Fenestra, 3 miles N.W. of Salerno. It is the seat of a bishop, suffragan to the pope, and contains a cathedral, three other churches, a convent, a house of refuge, an hospital, and a seminary. Silk, cotton, and linen are manufactured here, and in the numerous small villages that surround the town. The district is extremely unproductive, but the inhabitants have become wealthy by their industry and commerce. About 1 mile from Cava is the magnificent Benedictine convent of the Trinity, which formerly contained an excellent library, now transferred to Naples. This convent is now national property, and contains a lyceum and boarding-school. Pop. 10,000.

CAVAIGNAC, Louis Eugène, a French general who has become famous in connection with the events of 1848, was born at Paris on 15th October, 1802. His father, Jean Baptiste Cavaignac, was a furious revolutionist, and member of the Council of Five Hundred. Young Cavaignac entered the École

Polytechnique in 1820, and afterwards the military school at Metz, and in 1824 joined the 2d Regiment of engineers. He served in the campaign in the Morea, and in 1829 was appointed captain. Being at Arras on the outbreak of the revolution of 1830 he was the first officer in his regiment to declare for the new order of things. In 1832 he was sent to Africa, where he remained for several years, and greatly distinguished himself both by his valour in defending the French settlement against the Arabs and his judicious organization of military hospitals, barracks, and works of defence. In 1840 he was appointed to the command of the 3d Battalion of Zouaves, and shortly afterwards was obliged to quit the service from ill health, but soon joined it again, and was made commander of the Zéphyrs, or 2d Battalion of light African infantry. In this capacity he displayed great bravery in the defence of Cherchell against the Arabs, and was made first lieutenant-colonel and then colonel of Zouaves. In 1844 he received the appointment of brigadier-general, with the government of the province of Oran in Algeria.

Cavaignac was in Africa when the revolution of February, 1848, took place. In March of that year he was created by the provisional government general of division and governor of Algeria. Shortly afterwards the office of minister of war was offered to him but declined. On 23d April he was chosen representative of the department of Lot in the National Assembly, and proceeding to Paris to take his seat arrived there on 17th May. The capital was then in a state of great excitement from an attempt on the assembly by the Red Republicans two days before. Cavaignac was offered again the portfolio of the minister of war, and this time accepted it. The measures which he adopted to guard against the crisis which was evidently approaching were prompt and decisive. In a few days an army of nearly 30,000 men was assembled in and around Paris, and this precaution was speedily justified by the events which followed. On 23d June, at eleven o'clock forenoon, the terrible Communist insurrection burst forth, and for three days Paris presented the most dreadful scene of tumult and bloodshed which had been witnessed there since the massacre of St. Bartholomew. About 15,000 persons perished, and property was destroyed to the value of upwards of £200,000. By the energy of General Cavaignac, aided by the loyalty of the army and the national guard, the insurrection was suppressed on 26th June, and France saved from a threatened dissolution of all the bonds of society. On that day the National Assembly delegated the entire executive power to Cavaignac as dictator, who resigned it again into its hands on the 29th, and received it anew on the same day, with an acknowledgment by the legislative body of the services rendered by him to his country. Notwithstanding these he was defeated in the elections for the presidency in the month of December following, and Louis Napoleon was preferred to the office. On 20th December he resigned his dictatorship. After the *coup d'état* of 2d December, 1851, he was arrested and conveyed to the fortress of Ham, but was liberated after about a month's detention. Shortly afterwards he married Mademoiselle Odier, daughter of the banker of that name. In 1852 and in 1857 he was elected member for Paris of the legislative body, but on both occasions was incapacitated from taking his seat by refusing to take the oath of allegiance to the emperor. The last years of his life were spent at his country-seat in the department of Sarthe. He expired there suddenly of heart-disease on 28th October, 1857. He was latterly one of the principal contributers to the Siècle newspaper.

CAVAILLON (ancient *Cabellio*), a town of France, in the department of Vaucluse, 14 miles S.E. Avignon, on the right bank of the Durance, near the embouchure of the Coulon. It is agreeably situated, but ill built, with narrow, dirty streets. It is an ancient place, and has a cathedral built between the tenth and twelfth centuries, with a modern façade, a hôtel-de-ville, &c. The surrounding district is one vast garden, producing excellent fruit, in particular much esteemed melons and peaches. A considerable trade is carried on in silk, olive-oil, fruit, early vegetables, wool, &c. The industries comprise straw hats, edge-tools, tanning, currying, the preserving of fruits and vegetables, &c. The Romans had an important colony here, and erected many edifices, of which almost the only remains are some tombs, and the fragment of a triumphal arch. It was an episcopal city as early as the fifth century. Pop. (1891), 4757.

CAVALCANTI, GUIDO, a Florentine philosopher and poet of the thirteenth century, the friend of Dante, and like him a zealous Ghibelline. When the dissensions of the Guelfs and Ghibellines disturbed the public peace of Florence the citizens banished the chiefs of both parties. The Ghibellines were exiled to Sarzana. On account of the unhealthy air of that place they were permitted to return; but Cavalcanti had contracted a disease of which he died (1300) at Florence. In his youth he made a pilgrimage to St. Jago de Compostella in Galicia. Returning home through France he fell in love at Toulouse with a young lady of the name of *Mandetta*. To her most of his verses which we possess are addressed. They are remarkable, considering the period at which they were written, for their beautiful style. His Canzone d'Amore have gained him the most fame. The learned Cardinal Egidio Colonna and some others have made commentaries on it. His Rime, published by Cicciaporci, appeared at Florence in 1813.

CAVALIER, in fortification, is a work generally raised within the body of the place 10 or 12 feet higher than the rest of the works. It is most commonly situated within the bastion, and made much in the same form. Sometimes the cavaliers are placed in the gorges, or on the middle of the curtain; they are then made in the form of a horse-shoe. Their use is to command all the adjacent works and surrounding country. They are seldom made except when a rising ground overlooks some of the works. In modern times it is considered that cavaliers in a bastion occupy too much room, render retrenchments impossible, and unless a ditch separates the cavalier from the parapet of the bastion cause the grenades to fall upon the defenders of the latter, for which reasons it is considered best to put them on the curtains or behind the bastions.—CAVALIERS is the name given in English history to the partisans of King Charles I.

CAVALIER, JOHN, chief leader of the Camisards in the wars of the Cevennes, the son of a peasant, born in 1679 in the village of Ribaute, near Anduze. He was engaged in agricultural labours at Geneva when the cruel persecutions of the Protestants of the Cevennes by Louis XIV. induced him to return home. Several insurrections had already broken out, but he soon so distinguished himself by his courage and success, that, though only at the age of twenty-four, he became the acknowledged head of the insurgents. Notwithstanding their gallantry they were obliged to carry on the war on such unequal terms that the impossibility of success became apparent, and Cavalier entered into a capitulation with Marshal Villars, by which he obtained a pension of 1200 livres, a colonel's commission, and permission to raise a regiment of his own for the king's service. He was

summoned, however, to Versailles, and, finding himself looked upon with suspicion, he made his escape and soon after visited England. In the Spanish war, being supported by the English and Dutch, he commanded a regiment raised by himself and partly consisting of refugee Camisards, and distinguished himself greatly at the battle of Almanza in 1707, where he was severely wounded. He was afterwards pensioned by the British government, appointed governor of Jersey, made a major-general, and died at Chelsea in 1740.

CAVALRY, one of the three great classes of troops. The efficacy of cavalry arises partly from the moral impression which it produces on an enemy. This is greater in proportion to the size of the mass and the rapidity of its motion. Its adaptation to speedy movements is a more obvious advantage, which enables a commander to avail himself immediately of a decisive moment, when the enemy exposes a weak point, or when disorder appears in his ranks. It is a very important instrument in completing the defeat of an enemy, in disconcerting him by a sudden attack, or overthrowing him by a powerful shock. It is very serviceable in protecting the wings and centre of an army, for escorts, for intercepting the supplies of the enemy, for procuring intelligence, for covering a retreat, for foraging, &c. But in forests, in mountainous districts, on a marshy soil, &c., it is of but little avail in large bodies. The heavy cavalry, with or without defensive armour (cuirassiers), is more frequently employed in mass, where force is requisite; the lighter troops are used singly, and in small detachments, where swiftness and continued effort are required. Nevertheless, all forms of cavalry must be equally exercised in the duties appertaining to this kind of troops, and must be able to fight in the line as well as singly.

The use of cavalry is probably nearly as ancient as war itself; but some nations used chariots in war before they became accustomed to fight on horseback. The Egyptians are said to have had cavalry before the time of Moses. The Israelites, when at war with their neighbours, often had to encounter cavalry, but had none themselves until the time of Solomon. The cavalry of the Greeks formed a comparatively small force, but with them it was considered the most respectable class of troops, in which only the wealthy citizens served. The Persian cavalry, and, at a later period, the Macedonian, were much more numerous. The Romans had cavalry at an early period, as had also the Carthaginians. At a later period the cavalry of the Gauls was particularly good. In the middle ages the knights fought only on horseback, and disdained the foot-service. After the introduction of artillery, although cavalry was used, its manœuvres were awkward and inefficient. The genius of Gustavus Adolphus first perceived the important use which could be made of it, finding that its value chiefly consisted in the quickness of its motion, and Seidlitz, a general of Frederick the Great, further developed its use. Napoleon was aware of the great value of cavalry in large masses, but he often sacrificed them unsparingly. Lances are now common among the light cavalry of Europe, as they have proved a formidable weapon when skilfully used. In the Prussian cavalry, which are among the finest in the world, lancers are very numerous. The services of the Uhlans in the Franco-German war are hardly to be overestimated. Mounted infantry, whose horses are only used as a means of rapid movement, have been found an exceedingly useful class of troops. (See also ARMY.)

The British cavalry is classified as heavy, medium, and light. The heavy cavalry comprises five regiments, namely, the 1st and 2nd Life Guards, the Royal Horse Guards, the 1st Royal Dragoons, and the 2nd Dragoons or Scots Greys. The medium cavalry includes the 6th Inniskilling Dragoons, and twelve regiments of Dragoon Guards and Lancers; and thirteen regiments of Hussars constitute the light cavalry. Each of the thirty-one regiments is divided into four squadrons. German cavalry includes cuirassiers, lancers, and dragoons and hussars, corresponding roughly with the heavy, medium, and light sections of British cavalry; and in addition to four active squadrons, there is in each regiment a fifth depôt squadron. The same division of the regiment obtains in France, where the cavalry is classified as cuirassiers, dragoons, chasseurs, and hussars. In Austria the cavalry are all medium, and are divided into dragoons, hussars, and lancers, each regiment being in turn subdivided into six active and one depôt squadron. The Russian regular cavalry comprises cavalry of the guard and cavalry of the line, the latter being more of the nature of mounted infantry. The cavalry of the guard includes cuirassiers, lancers, hussars, and dragoons. There are also regiments of Cossacks employed as a sort of irregular cavalry. Each regiment of the regular cavalry includes seven squadrons, of which one acts as a depôt squadron. The staff of a British cavalry regiment includes a lieutenant-colonel, senior major, adjutant, riding-master, quartermaster, veterinary surgeon, two warrant officers, and eight non-commissioned officers. Each squadron is under a major and a captain, or two captains. A cavalry brigade for purposes of exploration, &c., consists of 3 regiments, 2 machine-guns, 1½ company of the Army Service Corps, bearer company, and a field hospital, making in all 114 officers, 2167 non-commissioned officers and men, and 2219 horses. A cavalry division for forming part of an army corps comprises 2 brigades, with 2 batteries of the Royal Horse Artillery, 2 machine-guns, a mounted detachment of engineers, a battalion of mounted infantry, an ammunition column, a company of the Army Service Corps, and a field hospital, making in all 325 officers, 6274 non-commissioned officers and men, and 6518 horses.

CAVAN, a county of Ireland, province of Ulster, having Fermanagh on the N., Leitrim on the W., and Longford and Westmeath on the S.; area, 467,025 acres, of which about one-third is arable or meadow land. The north-western part is occupied by a range of hills called the Ballymageeragh Mountains, but the remaining surface, which is undulating and irregular, is pervaded by bog and interspersed with many fine lakes. The chief rivers are the Erne, the Woodford, the Blackwater, and the Annalee, and the chief lakes Lough Ramor, Lough Sheelin, Lough Gowna, Lough Oughter, and Upper Lough Erne. Much of the soil of this county is cold, spongy, and inclined to be rushy. The chief cereal crop is oats, the chief green crop potatoes. Wheat is little cultivated. Flax is raised to some extent, and the high lands are mostly occupied in the grazing of store-cattle. Linen-bleaching and the distilling of whisky are the chief industries. The principal towns are Cavan, Cootehill, and Belturbet. The county returns two members to Parliament. Pop. in 1871, 140,555; in 1881, 129,476; in 1891, 111,917; in 1901, 97,368.

CAVAN, a town of Ireland, capital and chief business centre of the above county, 57 miles N.W. Dublin. In the principal street are some good houses, and in the other parts of the town new buildings have largely displaced older ones. There are churches for the Episcopalians, Roman Catholics, Methodists, and Presbyterians, an endowed school founded by Charles I., municipal and county offices, jail, union workhouse, a court-house, an infirmary, a fever hospital, and a Roman Catholic college. Pop. (1891), 2968.

CAVANILLES, Antonio Joseph, a Spanish clergyman and botanist, was born, 1745, at Valencia; died in Madrid, 1804. In 1777 he went to Paris with the children of the Duke of Infantado, and remained there twelve years, occupied with the study of several sciences, but chiefly with botany. He published there, in 1784, Observations on the Article Spain in the New Encyclopedia, written with as much patriotism as profound reasoning. In the following year he commenced his great botanical work, Monadelphiæ Classis Dissertationes decem (Paris, 1785-89; Madrid, 1790, 4to, with engravings). After his return to Spain he wrote another beautiful work, Icones et Descriptiones Plantarum, quæ aut sponte in Hispania crescunt aut in Hortis hospitantur (Madrid, 1791-99, 6 vols. folio, with 601 engravings). It contains a number of new genera and species, natives of Spain, America, India, and New Holland. In pursuance of a commission from the king, Cavanilles travelled in Valencia, and collected the materials for his Observaciones sobre la Historia Natural, Geografia, Agricultura, Poblacion, &c., del Reyno de Valencia (Madrid, 1795-97, two vols. folio, with copperplates from the drawings of the author). The work was published at the expense of the king, and intended as the first part of a similar work to embrace the whole of Spain. Thunberg has named a family of plants *Cavanilla*.

CAVATINA, in music, was the term applied to a short operatic air without a return or second part, and which is sometimes relieved with recitative, but now extended to the aria generally, especially if the character of expression is tender, hopeful, or joyous. In this elegant and gracefully melodic class of composition the Italians naturally eclipse all the other musicians; yet the Il mio Tesoro of Mozart will bear comparison with the finest ever written.

CAVE, or **Cavern**, an opening produced by nature in the solid crust of the earth. Caves are principally met with in limestone rocks, in gypsum, sometimes in sandstone, and in volcanic rocks (basalt, lava, tufa, &c.) The form of the caves depends partly upon the nature of the substance in which they exist; but it is frequently altered by external causes. Out of some caverns rivers take their course; others again admit rivers, or may be said to swallow them for a space. There are many and various causes for the formation of caves. Those in limestone and gypsum are unquestionably the results of the dissolving power of water; in fact the almost perfectly uniform direction, the gentle and equable declivity of most caves, appear to be the effect of the long continuance of water in them, the action of which has widened the existing crevices. In trachyte and lava caves appear to have been produced by the effects of gas. The caves of gypsum often contain foul air; the caves of limestone, various figures of stalactites, produced by the deposit of the lime dissolved in the water. Many of these lime caves contain remnants of bones of animals, such as hyenas, elephants, bears (see below). Many caves are remarkable only on account of their great size, or sublime from the awful gloom which pervades them, and the echoes which roll like thunder through their vaulted passages. Some are of great depth, as that of Frederikshall, in Norway, which is calculated to be 11,000 feet in depth. One of the grandest natural caverns known is Fingal's Cave, in Staffa, one of the Western Islands of Scotland. Its sides are formed of ranges of basaltic columns, which are almost as regular as hewn stone. The grotto of Antiparos, on the island of the same name, in the Archipelago, is celebrated for its magnificence. The roof is adorned with stalactites, many of them 20 feet long, and hung with festoons of various forms and brilliant appearance. In some parts immense columns descend to the floor; others present the appearance of trees and brooks turned to marble. The Peak Cavern in Derbyshire, England, is a celebrated curiosity of this kind. It is nearly half a mile in length; and, at its lowest part, 600 feet below the surface. The caves of Kirkdale, in England, and Gailenreuth, in Germany, are remarkable for the quantities of bones of the elephant, rhinoceros, and hyena found in them. In the rock of Gibraltar there are a number of stalactic caverns, of which the principal is St. Michael's Cave, 1000 feet above the sea. The most celebrated caves in America are Madison's Cave, in Rockingham county, Virginia, extending 300 feet into the earth, and adorned with beautiful incrustations of stalactites; Wyers' Cave, in the same county, extending 800 yards, but extremely irregular in its course and size; and the Mammoth Cave in Edmondson county, Kentucky, which incloses an extent of about 40 miles of subterraneous windings. One of its chambers, called the Temple, is said to cover a space of nearly 5 acres, and to be surmounted by a dome of solid rock 120 feet in height. The Cumberland Mountains, in Tennessee, contain some curious caverns, in one of which, at a depth of 400 feet, a stream was found with a current sufficiently powerful to turn a mill. Another cave in the same state is named Big Bone Cave, from the bones of the mastodon which have there been discovered. In the Racoon Mountains, near the N.W. extremity of Georgia, is a cave called *Nickojack Cave*, 50 feet high and 100 feet wide, which has been explored to the distance of 3 miles. A stream of considerable size runs through it, which is interrupted by a fall. Caves are sometimes found which exhale poisonous vapours. The most remarkable known is the Grotto del Cane, a small cave near Naples. In Iceland there are many caves, formed by the lava from its volcanoes. In the volcanic country near Rome there are many natural cavities of great extent and coolness, which are sometimes resorted to as a refuge from the heat. In South America is the cavern of Guacharo, which is said to extend for leagues.

Caves in which the bones of extinct animals are found owe their origin, for the most part, to the action of rain-water on limestone rocks, in which they most frequently occur. The deposit contained in these caverns usually consists of clay, sand, and gravel combined. In this deposit are imbedded remains of animals, and stones either angular or rounded. The bones scarcely ever occur in entire skeletons, but are scattered in such a way as to show that they must have been moved from their places subsequent to the death of the animals. They seldom, however, have suffered much from friction; and at times look so fresh that, but for the complete abstraction of the animal matter which they must have originally contained, they might be supposed to have been brought into the cavern a few weeks before. The most remarkable fact with regard to these bones is, that the most of them belong to animals which do not now exist at all, or exist only in regions far remote from those where caverns occur. Some of those found in European caverns belong to animals now found only in the tropical or sub-tropical regions, and others are the remains of animals now living in more northerly areas, while others, although evidently moulded on types similar to those of existing animals, differ from them in several essential features. To add to the difficulty of explanation, human bones have repeatedly been found mingled with those of the lower animals. The evidence of the cave remains proves the co-existence of man with animals not now living in the same areas; of these animals some are now extinct, as the cave bear and lion, the mammoth and mastodon, the tichorhine rhinoceros, &c., others have only migrated. Thus the reindeer is no longer found in Southern Europe; the *Hyæna crocuta*, found in the Gibraltar caves, now lives in South Africa. The ibex, the chamois, and a species of ground squirrel, once lived in the Dordogne, but are now found only on the heights of the Alps and Pyrenees. Thus it is evident that a considerable change of climate has taken place in Europe. Man's relation to these extinct animals, and his existence at the time these changes took place, are demonstrated by the discovery in the caves of human bones and worked flints beneath layers of hyena droppings, as in Wokey's Hole, near Wells; mixed up indiscriminately, as in Kent's Hole, with bones of elephant, rhinoceros, hyena, &c.; and by the fact that many bones of the extinct animals are split up, evidently for the sake of the marrow. In the Dordogne and Savigné caves fragments of horn have been found, bearing carved, or rather deeply scratched, outline figures of ibex, reindeer, and mammoth. The most remarkable bone-caves are those of Kirkdale, in Yorkshire; Kent's Hole, near Torquay; Wokey's Hole, near Wells; of Franconia, in Bavaria; the banks of the Meuse, near Liége; and the south of France.

CAVE, Edward, an English printer, the founder of the Gentleman's Magazine, was born in 1691. His first occupation was that of clerk to a collector of the excise in the country. He then went to London, and put himself apprentice to a printer. When his indentures expired he obtained a place in the post-office, and employed his leisure in writing for the newspapers. He published in January, 1731, the first number of the Gentleman's Magazine, which, under a considerably modified form, has continued till this day, amid the crowd of magazines which have been established since. Cave was deprived of his place in the post-office on account of his having resisted some abuses relative to the privilege of franking letters. He died January 10, 1754. During his last illness Dr. Johnson (who subsequently wrote his life) was often an attendant by his bedside.

CAVENDISH, Henry, born at Nice, Oct. 10, 1731, the son of Lord Charles Cavendish, and grandson of the second Duke of Devonshire, devoted himself exclusively to the sciences, and acquired a distinguished rank among those learned men who have most contributed to the progress of chemistry. He discovered the peculiar properties of hydrogen, and the qualities by which it is distinguished from atmospheric air. To him we owe the important discovery of the composition of water. Scheele had already observed that, when oxygen is mixed with double the quantity of hydrogen, this mixture burns with an explosion without any visible residuum. Cavendish repeated this experiment with the accuracy for which he was distinguished. He confined both the gases in dry earthen vessels, to prevent the escape of the product of their combustion, and found that this residuum was water, the weight of which was equal to the sum of the weights of the two gases. Lavoisier confirmed this conclusion in later times. (See Water.) The same spirit of accuracy in his experiments led Cavendish to another discovery which had escaped Priestley. The latter had observed that a quantity of atmospheric air, confined in a tube through which the electric spark was transmitted, lost in volume, and formed an acid which reddened the tincture of litmus; but he carried this experiment no farther. Cavendish repeated the experiment, by confining in the tube a solution of pure potash, which absorbed the acid, and he proved it to be nitric acid. The analysis of the air which remained in the tube after the experiment showed that the weight of the oxygen and nitrogen which had disappeared was equal to the weight of the acid thus formed. He easily determined the proportion of the nitrogen to the oxygen, which was 2 : ¾. It was found, also, that when both gases, sufficiently pure, were mixed in that proportion, and exposed to the electric spark, the mixture disappeared entirely, by which his discovery was completely confirmed. Cavendish distinguished himself no less in natural philosophy, by the accuracy of his experiments. He possessed also a profound knowledge of the higher geometry, of which he made a very happy use in determining the mean density of the earth. He found it to be 5½ times greater than the density of water—a conclusion which differs but little from that obtained by Maskelyne in another way. To the subject of electricity Cavendish also made some remarkable contributions, which, to understand thoroughly, it will be necessary to consult art. Electrostatics. Coulomb investigated the law of attraction between two electrified points *directly* by means of the torsion balance. Cavendish was, however, the author of the far more exact method of proving the law, which he expressed in the following syllogistic form. He demonstrates mathematically that, if the law of force be any other than the inverse square of the distance, electricity could not rest in equilibrium *at the surface* of a conductor. But experiment has shown that electricity does rest in equilibrium on the surface of a conductor. Hence the law of force must be the inverse square of the distance. He himself made excellent experiments in order to support his minor premiss. He did not, however, consider that his experiments justified him in holding the truth of it as thoroughly established, though he believed it to be true. Since his time the experimental researches of Faraday and others have completely demonstrated the truth of it, and therefore of the law above stated. Cavendish was a member of the Royal Society of London, and in 1803 was made one of the eight foreign members of the National Institute of France. An uncle left him a large fortune in 1773. This increase of wealth made no change in his character, which was cold and retiring, or in his habits, which were extremely simple. His large, well-chosen library was open for the use of learned men. He died in London, Feb. 24, 1810, and left £1,200,000 sterling to his relations. His writings consist of treatises in the Philosophical Transactions, from 1766 to 1792. They are distinguished by acuteness and accuracy.

CAVENDISH, or Candish, Thomas, an eminent navigator in the reign of Elizabeth. Having consumed his property by his early extravagances, he collected three small vessels for the purpose of making a predatory voyage to the Spanish colonies. He sailed from Plymouth in 1586, took and destroyed many vessels, ravaged the coasts of Chili, Peru, and New Spain, and returned by the Cape of Good Hope, having circumnavigated the globe in two years and forty-nine days, the shortest period in which it had then been effected. In 1591 he set sail on a similar expedition, in which his principal success was the capture of the town of Santos, in Brazil. After suffering many hardships, he died in 1593.

CAVENDISH, William, Duke of Newcastle, was born in 1592, and educated by his father, on whose death he was raised to the peerage. On the approach of hostilities between the crown and Parliament he embraced the royal cause, and was invested with a commission constituting him general of all his majesty's forces raised north of the Trent, with very ample powers. Through great exertions, and the expenditure of large sums from his private fortune, he levied a considerable army, with which, for some time, he maintained the king's cause in the north. In military matters he depended chiefly on his principal officers, it is said, but the numerous successes obtained by him render this unlikely. In 1643 he obtained a complete victory over Lord Fairfax on Adwalton Moor, and recovered all Yorkshire except Hull; but next year, on the arrival of the Scottish army and its junction with the Parliamentary forces, threw himself into York. Having been relieved by Prince Rupert, he was present at the battle of Marston Moor next day, after which he left the kingdom. His term of exile was chiefly spent in Antwerp, where he was for a time so straitened in circumstances that he had on one occasion to pawn his wife's jewels. He returned, after an absence of eighteen years, and was rewarded for his services and sufferings with the dignity of duke. He died on Dec. 25, 1676. His works include La Methode et Invention Nouvelle de dresser les Chevaux (Antwerp, 1657); A New Method and Extraordinary Invention to Dress Horses, &c. (1667); some comedies of no merit; and several worthless poems. His wife, Margaret (1624–1674), daughter of Sir Thomas Lucas, also wrote a number of more or less curious works, including Philosophical Fancies (1653); Poems and Fancies (1653); Philosophical and Physical Opinions (1655); Philosophical Letters (1664); various very poor plays, &c. Some of her writings have acquired a considerable reputation if not popularity, especially her autobiography, first published in her work entitled Nature's Pictures drawn by Fancie's Pencil (1656); and her Life of the Duke (1667), which 'is in its way a masterpiece'.

CAVENDISH, WILLIAM, first Duke of Devonshire, was the son of William, third Earl of Devonshire. He was born on Jan. 25, 1640, and instructed with great care in classical literature. On various occasions he distinguished himself by his spirit and valour, and in 1677 began that opposition to the arbitrary measures of the ministers of Charles II. which caused him to be regarded as one of the most determined friends of the liberties of his country. Intimately connected with Lord Russell, he joined him in his efforts for the security of free government and the Protestant religion. On the trial of Lord Russell he appeared as a witness in his favour, and offered to assist him in escaping, after he had been sentenced to death, by changing clothes with him in prison. In 1684, having succeeded to his father's title, and being regarded as one of the most formidable opponents of the arbitrary designs of King James II., attempts were made to intimidate him, but without success. Having been insulted by a minion of the king, he knocked him down in the royal presence, and was sentenced to pay a fine of £30,000. He took an active part in promoting the Revolution, and was one of the first who declared for the Prince of Orange. His services were rewarded with the dignity of Duke of Devonshire. He still, however, maintained an independent bearing in Parliament. He died on 18th Aug., 1707.

CAVERY, CAUVERY, or KÁVERI, a river of Hindustan, to the waters of which Mysore and the Carnatic owe much of their agricultural wealth. It rises from several head-streams in Coorg and Mysore, near the coast of Malabar, flows S.E. through Mysore and the Madras Presidency, and after a winding course of about 470 miles falls into the Bay of Bengal by numerous mouths, the largest being the Coleroon. Where it separates Mysore from Coimbatore the Cavery forms an island called Sivasamudram, near which are two magnificent cataracts, each about 200 feet high, and more or less broken into cascades according to the volume of water. In connection with this river and its tributaries important canals and dams have been constructed for purposes of irrigation, with the effect of rendering the country on either side highly productive. The Cavery is filled by the monsoon rains in May and July, but is not navigable excepting by small boats.

CAVERYPAUK, a town of Hindustan, in the North Arcot division of Madras Presidency, 57 miles W.S.W. of Madras. It is meanly built, and the adjoining fort, at one time a place of some strength, is now in ruins. A victory was gained here by the British under Clive over the French and their allies in 1752. Near the town is an immense water-tank, 8 miles long by 3 broad, which fertilizes a large tract of country, and is perhaps the finest work of the kind in South India. Pop. (1891), 6259.

CAVIARE is made in Russia from the roe of some large fish, principally the sturgeon. The roe is separated from the skin which incloses it, washed in vinegar, and dried before the sun. A quantity of salt is then rubbed in with the hand; it is then put into a cloth and pressed to remove the liquor, after which it is packed into barrels ready for the market. The chief place for the production of caviare is Astrakhan, where great quantities of sturgeon are caught in the Volga. Caviare is imported into the United Kingdom only to a small extent.

CAVITÉ, a town in the island of Luzon, one of the Philippines, at the extremity of a point of land projecting in a north-easterly direction into the Bay of Manilla, about 12 miles S.W. of Manilla. It is the capital of a province of the same name, and is built principally of stone. It has a church, barracks, convent, and hospital. The establishment of a cigar manufactory has added considerably to the commercial importance of the town. Its docks and arsenal were once famous. Pop. 9230.

CAVOUR, COUNT CAMILLO BENSO DI, a distinguished Italian statesman, was born at Turin on Aug. 10, 1810, and descended from an ancient noble family. He was educated in the military academy at Turin, and devoted himself with eager enthusiasm at an early period of life to the study of political economy, Adam Smith being his favourite author. After completing his studies he made a journey to England, where he remained for several years, making himself acquainted with the principles and working of the constitution, and forming friendships with some of the most distinguished of the leading men. In 1842 he returned to Turin, where shortly afterwards he published in the Bibliothèque Universelle of Geneva his Considerations on the Present State and Future Prospects of Ireland, which were subsequently translated into English. Along with Count Balbo and other coadjutors he established in 1847 the journal of the Risorgimento, which advocated the cause of progress, and contained the germs of many of those leading ideas regarding the unity and independence of Italy, and the diminution of ecclesiastical influence, which were afterwards carried out so resolutely under Cavour's administration. It was not, however, till after the battle of Novara that he entered that political arena in which his name has since become so famous. He became a member of the Chamber of Deputies in 1849, and the following year succeeded Santa Rosa as minister of commerce and agriculture. In this office he set himself strenuously to promote the internal prosperity of the country by the establishment of railways and an improved system of postal communications, while he sought to develop its commerce and manufactures by adopting the principles of free-trade, and remodelling the system of finance. A new organization was given to the military and naval forces; and the monasteries, which had hung as dead weights on the advance of education and freedom of thought, as well as material prosperity, were, with certain exceptions, suppressed. In November, 1852, Cavour became premier, and not long afterwards gave a signal proof of his statesmanship by the part which he took in cementing an alliance with Great Britain and France, and making common cause with these powers against the aggressions of Russia. The prestige thus gained to the arms of Sardinia was no less important than that acquired by her liberal and reforming policy in civil matters. The attitude, however, thus taken by Sardinia could not fail to prove extremely offensive to the neighbouring power of Austria, to whose arbitrary and repressive measures the government of Victor Emmanuel displayed itself as a standing reproof, and whose supremacy in Italy was eminently jeopardized by the aspirations of Sardinia. A collision, therefore, was inevitable, resulting in the campaign of 1859. The intimate connection formed at that time with France, who lent her powerful assistance in the prosecution of the war, was mainly due to the agency of Cavour, who was accused by some on this occasion of having purchased the assistance of Louis Napoleon by unduly countenancing his ambitious projects. The marriage of Victor Emmanuel's daughter, the Princess Clotilde, with Prince Napoleon, was consummated in the early part of 1859, and the conclusion of the same year witnessed the cession of Nice and Savoy to France. In bringing about both of these results Cavour took a leading part. In 1860 Garibaldi's expedition to Sicily took place; but towards this and the subsequent movements of the Italian liberator Count Cavour manifested an apparent coldness, which diminished somewhat his estimation in the minds of the more zealous Italian patriots. In May, 1861, he was seized with an attack of typhus fever, but after a few days seemed to be in a fair way of recovery. A relapse, however, took place; he rapidly sank, and expired on the morning of 6th June.

CAWNPORE, a town, India, capital of the district of the same name, on the right bank of the Ganges, which is here about a mile wide, 115 miles N.W. from Allahabad. Previous to the mutiny of 1857 it was a place of considerable importance, having both an extensive commerce, and forming one of the principal military stations in India. The city proper contained a population of 59,000, while the cantonments extending along the bank of the river for nearly 7 miles included about 50,000 more, besides the military and European residents. The bungalows of the latter were among the handsomest in India, placed in the most picturesque situations, and surrounded by beautiful gardens. There were no fine public buildings, however, nor did the town possess any historical associations, having merely risen to eminence since its selection as a military station by the British in 1777. In the month of June, 1857, the native regiments stationed here, following the example set by those at Meerut and elsewhere, mutinied and marched off, placing themselves under the command of the Rajah of Bithoor, the notorious Nana Sahib. General Wheeler, the commander of the European forces, intrenched himself as he best might, and defended his position for some days with great gallantry, but pressed by famine and loss of men, was at length induced to surrender to the rebels on condition of his party being allowed to quit the place uninjured. This was agreed to, but it is well known how the stipulation was observed. After the European troops, with the women and children, had been embarked in boats on the Ganges, they were treacherously fired on by the rebels; many were killed, and the remainder conveyed back to the city, where the men were massacred and the women and children placed in confinement. The approach of General Havelock to Cawnpore roused the brutal instincts of the Nana, and on 15th July he ordered his hapless prisoners to be slaughtered, and their bodies to be thrown into a well. The following day he was obliged, by the victorious progress of Havelock, to retreat to Bithoor. For some time after these events Cawnpore presented little more than a heap of ruins, but having been rebuilt, it now possesses far more inhabitants than before, and is rapidly increasing. It covers a large area, but has few or no buildings of architectural note, nor is its situation in any way picturesque. It has several churches, a theatre, various military and other offices, high school, club, &c. On the site of General Wheeler's entrenchments a memorial church has been built, and round the fatal well fine gardens covering fifty acres have been laid out. Over the well a mound has been raised, on the top of which is a Gothic wall inclosing an octagonal space, and in the centre of this is the figure of an angel in white marble (by Marochetti), with arms crossed on the breast, and in each hand a palm branch. Cawnpore is the centre of a considerable trade in grain and other agricultural produce, and has manufactures of cottons, leather, and leather goods. Pop. in 1881, 151,444; in 1891, 188,712.

CAXAMARCA, a town of Peru, capital of a province of the same name, about 70 miles from the Pacific Ocean, 280 N. Lima. It was here where the Emperor Atahualpa was put to death, after having been defeated and imprisoned by Pizarro. Pop. 12,000.

CAXTON, WILLIAM, the first English printer, was born in Kent about 1422. In 1438 he was bound apprentice to Robert Large, a mercer in London, and soon after his master's death (1441) he went to Bruges, where, in 1446, he went into business on his own account. About 1463 he was appointed 'governor' at Bruges for the English merchants settled in the Low Countries, a post in which he continued for some years. About 1471 Caxton entered the service of Margaret, Duchess of Burgundy, sister of Edward IV. He had already begun a translation of the popular romance entitled Le Recueil des Histoires de Troye, and this he finished at Cologne in 1471. In order to meet the demand for the book he learned the art of printing, probably at Cologne, and his Recuyell of the Histories of Troy, the first English printed book, appeared about 1474, having issued, it is supposed, from the press of Colard Mansion at Bruges. His Game and Playe of the Chesse, also a translation from the French, was probably a production of the same press in 1475, and is the second English book printed. He left Bruges in 1476, returned to England, and in 1477 had a press at Westminster Abbey, where he printed the Dictes and Sayings of the Philosophers, the first typographical work executed in England. Caxton continued to exercise his art for about fourteen years, during which time he produced nearly eighty works, many of them translated by himself from the French, and one of them—Reynard the Fox—from the Dutch. He was patronized by Edward IV., Richard III., and Henry VII.; and he was on intimate terms with Earl Rivers, the Earl of Worcester, and others of the nobility, the two noblemen named having even translated works for his press. He died in 1491, and was buried in the church of St. Margaret's, Westminster. Besides the books already mentioned, Caxton printed Chaucer's Canterbury Tales, Troylus and Creside, Book of Fame, and translation of Boethius; Gower's Confessio Amantis; works by Lydgate; Malory's King Arthur; the Golden Legend; the Fables of Æsop, &c. His books have no title-pages, but are frequently provided with prologues and colophons. His types are in the Gothic character, and copied so closely from the handwriting of his time that many of his books have been mistaken for manuscript. In some no punctuation is used; in others the full point and colon only; commas are represented by a long or short upright line. Copies of some of his books now fetch extraordinary prices when sold: a unique copy of the King Arthur has brought £1950, the Recuyell £1820. The standard Life of Caxton is that by W. Blades.

CAYENNE, the capital of the French colony of Guiana, is situated on the coast, on a small island, separated from the mainland by the rivers Cayenne and Mahury, and a natural canal which unites them. It presents a fresh and pleasant appearance, from the number of palms and other trees growing among the houses, but is far from healthy, being liable to attacks of yellow fever. The rainy season lasts for eight months. The chief edifice is government house. The convicts are not now stationed here, but at other points of the colony. The harbour admits vessels of 500 tons. Cayenne is the only town in the colony of French Guiana. (Pop. 1895), 12,351.

CAYENNE PEPPER, or CAPSICUM. Capsicum is the name of several species of South American and Indian plants, of the natural order Solanaceæ, easily known by their hollow pods, of a shining red or yellow colour, which contain many small, flat, and kidney-shaped seeds. The principal species are heart or bell pepper (*Capsicum grossum*), Guinea pepper (*Capsicum annuum*), and bird-pepper (*Capsicum baccatum*). All the species of capsicum possess the same general qualities. In hot climates, but particularly in the East and West Indies, and some parts of Spanish America, the fruit of these plants is much used for culinary purposes. It is eaten in large quantities, both with animal and vegetable food, and is mixed in greater or less proportion with almost all kinds of sauces. The Cayenne pepper used in cookery is made from the fruit of different species of capsicum. This fruit when ripe is gathered, dried in the sun, and then pounded; and the powder is mixed with a certain portion of salt, and kept for use in closely-stopped bottles. It is very generally used as an ingredient in soups and highly-seasoned dishes. Its taste is extremely acrid. When taken in small quantities Cayenne is a grateful stimulant, and in medicine is used both externally and internally. The Guinea pepper, or annual capsicum, is considered the most hardy of this whole tribe of plants; and in many parts of the south of Europe its fruit is eaten green by the peasants at their breakfasts, and is preferred by them to onions or garlic. The fruit of all the species may be used in domestic economy either as a pickle, or when dried before a fire, and ground to powder in a common pepper-mill, as Cayenne pepper.

CAYES, LES, or AUX CAYES, a sea-port town on the S. coast of Hayti; 30 miles S.S.E. Port-au-Prince; lat. 18° 13′ N.; lon. 74° 31′ W. This town at one time contained 12,000 or 15,000 inhabitants. It is now very much reduced. The harbour is inferior, but the surrounding country is fertile.

CAYLUS, ANNE CLAUDE PHILIPPE DE TUBIÈRES, &c., COUNT OF, an archæologist, born Oct. 31, 1692, at Paris. After having served in the army during the war of the Spanish Succession, he left the service in 1715, accompanied Bonac on his embassy to Constantinople the following year, and visited Greece, Troy, Ephesus, Byzantium, and Adrianople. In 1717 he returned to Paris, according to the wish of his mother, and began the arrangement of his extensive collections. He commenced a great work on Egyptian, Grecian, Etruscan, Roman, and Gallic antiquities, with numerous plates. He was a member of the Academy of Painting and of the Academy of Inscriptions, and divided his labours between them. He made a chemical examination of the ancient method of encaustic painting, investigated the mode of painting on marble, the art of hardening copper, the mode by which the Egyptians raised great weights, the mummies, painting on wax, and many other subjects. If he has sometimes misunderstood the ancient authors, and committed some errors with respect to ancient monuments, he has, nevertheless, with great success treated of the processes and materials employed in the arts by the ancients. He died in 1765. Integrity, simplicity, and disinterestedness were united in his character with occasional traits of dogmatism. He has left numerous works, tales as well as antiquarian researches. Among the latter is his Recueil d'Antiquités Égyptiennes, &c. (Paris, 1752–67, seven vols.) Caylus was also an industrious and skilful engraver, and produced a collection of more than 200 engravings, after drawings in the royal cabinet, and a great number of heads, after the first masters. His mother, niece of Mad. de Maintenon, made herself known by a spirited little work, Mes Souvenirs.

CAYMAN. See CAIMAN.

CAYMAN ISLANDS, a group of three situated about 140 miles N.W. of Jamaica, of which they are dependencies. Grand Cayman, the largest of the three is 17 miles long, and from 4 to 7 broad. It is well wooded and similar to Jamaica in its natural products. The natives, about 4000 in number, are chiefly employed in agricultural operations or in trading with Jamaica and other places in schooners which they build for themselves. They cultivate the sugar-cane and vegetables, and rear cattle, pigs, poultry, &c. Turtle and cocoa-nuts are exported. The climate is exceedingly healthy. The chief village is George Town. A large proportion of the inhabitants are whites. There are several Presbyterian places of worship. Cayman Brac has about 500 inhabitants mostly whites, Little Cayman 40 or 50 all whites.

CAZALLA-DE-LA-SIERRA, a town, Spain, Andulasia, in the province and 36 miles N. by E. of Seville, on a declivity of the Sierra Morena. Its streets are clean, paved, and well arranged; and it has two squares, in the principal of which are the ancient church and town-hall. The mountains in the vicinity are rich in metals. Pop. (1887), 8481.

CAZEMBE'S DOMINION, formerly a large and well-ordered negro state of Central South Africa, lying S. and S.W. of Lake Tanganyika, and so called from the title of the sovereign. The country is not well-known as yet, though our knowledge of it has been considerably increased by Dr. Livingstone's discoveries, and others since. The region forms a kind of basin, bounded on the E. by a plateau which rises to the height of from 3000 to 4000 feet; on the W. also it is bounded by a series of heights. On the S. it has the lofty water-shed which separates its streams from those of the Zambesi River system. Its principal stream is the Chambezi, which flows westward into Lake Bangweolo, then northwards, under the name of the Luapula, into Lake Moero. The ruler, or muata, used to be believed to be a great magician; he had over 600 wives, and maintained a well-armed body of troops, numbering at one time, it is said, 20,000. His dominions were divided into districts, each of which had a governor of its own. These and other men of rank formed a body of privileged nobility; all the rest of the inhabitants, farmers, artisans, &c., were looked upon as slaves of the ruler. The population consisted of a ruling race, the Campololos, who had invaded and conquered the country, and the Messiras, the original inhabitants. It was only Campololos that received official posts, and the

Campololo language was the one spoken at court. The people were industrious agriculturists, growing crops of mandioc, maize, sorghum, &c. They manufactured coarse cloths, cords, nets, lines, &c., from cotton and the fibres of certain plants; made weapons and implements of iron from the ore that exists in their country; also earthenware, wooden vessels, &c. The existence of this state had long been known to the Portuguese, Lunda, the former capital, having been visited by Lacerda in 1799. Additional information regarding the country was furnished by the Portuguese expedition under Monteiro and Gamitto in 1831. Dr. Livingstone, who visited the country in 1867, stayed forty days at Cazembe's capital, which he found to consist of a number of huts dotted over a large area, and having probably not more than a thousand inhabitants. The hut of the Cazembe was very much larger than the others, and was situated inside a quadrilateral inclosure measuring 300 by 200 yards. The Cazembe at this time was a usurper, whose cruelties had done much to dispeople the country, and Dr. Livingstone thought it doubtful if he could bring a thousand warriors into the field. The country, which has been ravaged by the slave trade, now belongs partly to the British sphere of influence partly to the Congo State.

CAZORLA, a town, Spain, Andalusia, in the province and 41 miles E. of Jaen; pop. (1887), 6197. It rises in the form of an amphitheatre on the slope of the Sierra de Cazorla, and is well built, though much less important and populous than in the time of the Moors, in whose wars it makes an important figure. The Sierra de Cazorla is a wooded ridge round which winds the upper course of the Guadalquivir.

CAZOTTE, Jacques, an author distinguished by facility and liveliness of style, born in 1720, at Dijon, studied with the Jesuits, and went, in 1747, to Martinique. On his return to France he lost above £11,000 on letters of exchange received from the Jesuits, to whose superior, Lavalette, he had sold his possessions in Martinique. The lawsuit which he commenced on this occasion may be considered as the beginning of all the proceedings against the Jesuits in France. Cazotte shone in society among the *beaux esprits*. His romance of chivalry, Olivier, published in 1763, and subsequently his Diable amoureux, the Lord Impromptu, and Œuvres morales et badines, are proofs of his rich imagination and his talent for writing with ease and precision. Being received into the order of Martines de Pasqualis, Cazotte lost himself in cabalistic dreams. With the assistance of Dom Chavis, an Arabian monk, he produced four volumes of Arabian Tales—a sort of continuation of the Arabian Nights, forming the thirty-seventh and fortieth volumes of the Cabinet des Fées. Though at the age of seventy years, he wrote them at midnight, after his return from the circles in which he had been visiting. Chavis dictated the outlines, and Cazotte wrought up the stories. He completed the task in two winters. The comic opera Les Sabots he composed in one night. In the revolution, which he opposed with all his power, he was thrown into the prison of the Abbaye, with his daughter Elizabeth, in 1792. When the massacre of the prisoners took place, Sept. 2 and 3, Cazotte being delivered into the hands of the assassins, his daughter cast herself between him and the murderers, and prevented the execution of their purpose; but he was again condemned to death, and executed Sept. 25. From the scaffold he cried with a firm voice to the multitude, 'I die as I have lived, faithful to God and to my king.'

CAZWINI, Zacharia Ben Mohammed, an Arabian naturalist, descended from a family of lawyers, who derived their origin from Anas Ben Malek, a companion of Mohammed, and had settled in Casbin or Cazwin, a city in Persia. From that place this author received the surname under which he has become celebrated. Of the circumstances of his life we know only that he was cadi of Wazith and Hillah, and died in the year of the Hegira 682 (A.D. 1283). His most important work is on natural history—The Wonders of Nature and the Peculiarities of Creation—of which Ideler, professor in the University of Berlin, published the chapter on the Constellations of the Arabians, and of which there are fragments in Bochart's Hierozoikon, in Ouseley's Oriental Collections, and in Wahl's, Jahn's, and De Sacy's Arabic Chrestomathies. It was the object of Cazwini, like Pliny, to describe the wonders of all nature. His work contains a comprehensive view of all that had been written before him, but in so grand and original a manner that it is of higher value than most of the original works which treat of the same subjects. There is an abridged translation of it in the Persian.

CEARÁ, a province or state on the north coast of Brazil, bounded on the N. by the Atlantic, E. by Rio Grande do Norte, S. by Pernambuco, and W. by Piauhy, with an area of 40,240 square miles, and a coast-line of about 190 miles. The population, by the census at the end of 1890, amounted to 805,687. The surface gradually ascends southwards from the Atlantic, and terminates in a chain of lofty heights, generally well wooded with various kinds of palms. The higher grounds are fertile, but the lower sandy, often almost sterile, and partly covered with lakes strongly impregnated with alum and nitre. The climate is on the whole salubrious, the heat, which would be almost insupportable, being greatly tempered by sea-breezes. The province sometimes suffers from long-continued drought. Among its productions are numerous medicinal plants, gums, balsams, and resins. The minerals include gold, silver, iron, copper, lead, alum-stone, lignite, salt, saltpetre, and rock-crystals. Ceará is divided into twenty-five town districts, which take the names of the different towns in the neighbourhood; but the political or administrative division is into fifteen comarcas and twenty termos. The first Portuguese colony in Ceará was founded in 1610, in the neighbourhood of the present capital. In 1637 it was taken possession of by the Dutch, who, in 1644, were driven out by the natives. The capital, also called Ceará, has an extensive harbour, and carries on a large trade, and is now a railway terminus. Pop. about 36,000.

CEBES of Thebes was a disciple of Socrates. He is said to have saved Phædon, a young slave, from moral ruin. Nothing more is known of his life. Three dialogues—Hebdome, Phrynichus, and Pinax, or the Picture—are ascribed to him; but some critics regard the latter as the work of a later Cebes, or of a Stoic philosopher under this assumed name. Since the revival of learning this interesting dialogue has been often reprinted by itself, or in connection with the writings of Epictetus, Theognis, Pythagoras, &c. Among the larger editions is that of Schweighäuser (Strasburg, 1806). There are many school editions.

CECIL, Robert, Earl of Salisbury, second son of Lord Burleigh, was born, according to some accounts, about the year 1550; but his birth may, with more probability, be placed in 1563. He was deformed, and of a weak constitution, on which account he was educated at home till his removal to the University of Cambridge. Having received the honour of knighthood, he went to France as assistant to the English ambassador, the Earl of Derby, and in 1593 was appointed one of the secretaries of state. On the death of Sir Francis Walsingham he succeeded him as principal secretary, and continued to be a confidential minister of Queen Elizabeth to the end of her reign. Having secretly supported the interests of James I. previous to his accession to the crown, and taken measures to facilitate that event, he was continued in office under the new sovereign, and raised to the peerage. In 1603 he was created a baron; in 1604 Viscount Cranbourn; and in 1605 Earl of Salisbury. The same year he was chosen Chancellor of the University of Cambridge, and made a knight of the Garter. He was the political rather than the personal favourite of the king, whom he served with zeal and fidelity; and as he was certainly the ablest, so he was perhaps the most honest minister who presided over the affairs of state during that reign. In 1608 Lord Salisbury was made lord high-treasurer, an office which he held till his death in 1612.

CECIL, WILLIAM, Lord Burleigh. This eminent English statesman was the son of Richard Cecil, master of the robes to Henry VIII., and was born at Bourne, in Lincolnshire, in 1520. He studied at St. John's College, Cambridge, whence he removed to Gray's Inn, with a view to prepare himself for the practice of the law. Having carried on a successful controversy with two Irish priests on the subject of the pope's supremacy, he obtained the notice of the king: and, being presented with the reversion of the office of *custos brevium*, was encouraged to push his fortune at court. Having married the sister of Sir John Cheke, he was, by his brother-in-law, recommended to the Earl of Hertford, afterwards the Protector Somerset. Having lost his first wife, he took for a second the daughter of Sir Anthony Cooke, director of the studies of Edward VI.; and by his alliance with this lady, herself eminent for learning, still further increased his influence. He rose in 1547 to the post of master of requests, and soon after to that of secretary. He endured in this reign some of the vicissitudes which befel his patron Somerset, but always recovered his standing, and in 1551 was knighted, and sworn a member of the privy-council. His declining to aid the proclamation of Lady Jane Grey secured him a gracious reception from Queen Mary, although he forfeited his office because he would not change his religion. In 1555 he attended Cardinal Pole and the other commissioners appointed to treat for peace with France: and on his return, being chosen knight of the shire for the county of Lincoln, distinguished himself by opposing a bill brought in for the confiscation of estates on account of religious principles. His foresight led him into an early correspondence with the Princess Elizabeth, previously to her accession; to whom in her critical situation his advice was exceedingly serviceable. On her accession in 1558 he was appointed privy-councillor and secretary of state. One of the first acts of her reign was the settlement of religion, which Cecil conducted with great skill and prudence, considering the difficulties to be encountered. In foreign affairs he showed much tact in guarding against the danger arising from the Catholic powers, and very judiciously lent support to the Reformation in Scotland. The general tenor of Cecil's policy was cautious, and rested upon an avoidance of open hostilities, and a reliance on secret negotiation and intrigues with opposing parties in the neighbouring countries, with a view to avert the dangers which threatened his own. This, upon the whole, was a course almost necessary, considering the situation of England, with a powerful, dissatisfied party at home, much dangerous enmity on the part of Catholic Europe, and an alliance existing between Scotland and France. On the suppression of the northern rebellion in 1571 Elizabeth raised him to the peerage by the title of Baron Burleigh, and the following year made him a knight of the Garter. He is charged with being deeply engaged in fomenting the troubles which caused the flight of the imprudent and unhappy Mary Stuart into England; and after the discovery of Babington's conspiracy, he never ceased urging her trial and condemnation. He endured for a short time the hypocritical resentment of Elizabeth at the execution of the Queen of Scots, but after a while recovered his former credit. At the time of the threatened Spanish invasion he drew up the plan for the defence of the country with his usual care and ability; but soon after losing his wife, to whom he was warmly attached, he became desirous of retiring from public business, and of leaving the field open to his son Robert, afterwards Earl of Salisbury. He was persuaded, however, to keep his employment, and one of his latest efforts was to effectuate a peace with Spain, in opposition to the more violent counsels of the Earl of Essex. He died in 1598.

CECILIA. There are several saints of this name in the Catholic Church. The most celebrated is the patron saint of music, who has been falsely regarded as the inventress of the organ, and who is said to have suffered martyrdom A.D. 230, although other dates are given. Her pagan parents, says the legend, betrothed her, contrary to her wishes, to Valerian, a young pagan. But she had internally vowed to the Lord a perpetual virginity; and whilst the instruments sounded she sang in her heart to the Lord, that is, she prayed—O Lord, allow my heart and my body to remain unpolluted. As soon as the bridegroom appeared she forbade his approach, assuring him that an angel of the Lord protected her innocence. The unbelieving Valerian wished to convince himself of this assertion; she referred him to the Bishop Urban, who was concealed among the tombs of the martyrs, and who instructed him in the Christian religion and baptized him. When he returned to the bride he saw the protecting angel, who presented them both with crowns of heavenly roses and lilies. Valerian now induced his brother Tubirtus to embrace the Christian faith. The Roman prefect Almachius caused both brothers to be beheaded as zealous professors of Christianity. Life was to be given to Cecilia if she would sacrifice to the heathen gods; but she remained firm in her belief. Upon this the tyrant caused her to be shut up in a bath of boiling water, in which she was found the day after unhurt. The executioner was then directed to behead her; he inflicted three blows, but was not able to separate the head from the body. She lived for three days, exhorting the faithful and giving alms to the poor. As early as the fifth century we find a church in Rome dedicated to her. Pope Paschalis, who was very anxious to gather relics, endeavoured to discover her body. She appeared to him, as he relates in his letters, while he was sleeping, and pointed out the place of her sepulchre. Paschalis caused the body to be disinterred in 821, and placed it in the church which he rebuilt, where her monument is still to be seen. How Cecilia came to be the patron-saint of music is not agreed. The various opinions, however, seem to be united in this point, that it was either through a misunderstanding, or through an allegorical interpretation of the words above cited from her legend. Her worship in this character is very ancient. Her story forms one of Chaucer's Canterbury Tales, and Dryden in his Alexander's Feast, and Pope in his ode for music on St. Cecilia's Day have sung her praises. Raphael, Domenichino, Dolce, and Mignard, have represented her in celebrated paintings. In the picture of Raphael she appears as the personification of heavenly devotion. Her body is said by De Rossi to have been discovered by Card. Sfondrati in 1599, and her crypt was discovered by De Rossi himself in 1855.

CECROPIA, a genus of plants of the order Artocarpaceæ, of which the best known species is the Trumpet-Tree (*C. peltata*) of the West Indies and tropical South America. It attains a height of some fifty feet, and has a hollow stem and branches, from which musical instruments are made. Its leaves are very large, circular, and peltate, and serve as food for sloths; and its flowers are small and grouped in short spikes, several of which are inclosed at first in a large bract. The wood is light and soft, and is employed by the natives in various ways. Ropes are made from the inner bark, and the outer bark has astringent properties. Caoutchouc is obtained from the juice, and the buds are employed as a pot-herb. Ants are very fond of dwelling in the hollow stems.

CECROPS, according to Greek tradition, was the founder of Athens, and the first king of Attica. He was said to have been an autochthon (sprung from the soil), and was sometimes represented as half man half dragon. He taught the savage inhabitants religion and morals, made them acquainted with the advantages of social life, and laid the foundation of the future city of Athens, which after him was originally called *Cecropia*. He is also said to have introduced the art of ship-building. He died after a reign of fifty years. (See ATTICA.) By the later Greeks he was represented as having led a colony to Attica from Sais in Egypt about 1400 or 1500 B.C., but the best modern critics do not look upon this event, nor on the life of Cecrops at all as historical. There is no doubt that Egypt did have a certain influence on the development of civilization in Greece, but how great this influence was, or in what manner exercised, history does not furnish sufficient data to enable us to decide. It is probable that the true Cecrops was a hero of the Pelasgian race.

CEDAR (*Cedrus*), a majestic evergreen coniferous tree, with large spreading branches, a native of Asia and Africa. The most celebrated is *C. Libani*, Cedar of Lebanon, a wide-spreading tree, from 50 to 80 feet high; its leaves are tufted and perennial; cones ovate, abrupt, with close-pressed scales, and not produced till the tree is five-and-twenty or thirty years old. When a seedling the cedar of Lebanon affects the spire-like or pyramidal form, like most of its kindred, and consequently the trunk is usually straight and erect. But when it has reached maturity 'the leading shoot becomes greatly diminished or entirely ceases to grow; at the same time the lateral branches increase in size and length, so as at last to cover a space whose diameter is often much greater than the height of the tree itself'. It is then a wide-spreading tree with a flattened pyramidal summit, and with horizontal branches usually disposed in so many tiers or stages. This horizontality of ramification is very striking and characteristic, and is preserved throughout all the limbs and branches down to the smallest twigs. A person who climbs the tree passes, as it were, a succession of verdant floors, out of which stand the beautiful cones. As its leaves remain two years on the branches, and as every spring contributes a fresh supply, it is an evergreen, in this resembling other members of the fir family, which, the larches excepted, retain the same suit for a year or upwards.

Cedars still grow on Lebanon, but not in any other part of Palestine, not even on Hermon, Anti-Lebanon, or the highest forests of Gilead. (Tristram, Natural History of the Bible.) There is one group on the Lebanon, not far from Tripoli, to which almost every tourist pays a pilgrimage. Lamartine, who visited them in 1832, speaks of them thus:—'These trees are the most renowned natural monuments in the universe; religion, poetry, and history have all equally celebrated them. The Arabs of all sects retain a traditional veneration for these trees. They attribute to them not only a vegetative power which enables them to live eternally, but also an intelligence which causes them to manifest signs of wisdom and foresight similar to those of reason and instinct in man. They are said to understand the changes of the seasons; they stir their vast branches as if they were limbs; they spread out or contract their boughs, inclining them towards heaven or towards earth according as the snow prepares to fall or to melt! Every year in the month of June the inhabitants of Beschierai, of Eden, of Kanobin, and the other neighbouring valleys and villages, climb up to those cedars and celebrate mass at their feet. How many prayers have resounded under these branches, and what more beautiful canopy for worship can exist!' They grow at an elevation of about 6000 feet above the sea, and where for a long period of every year they are surrounded by snow. The circumference of the twelve largest varies from about 18 to 47 feet. There are many other groves, clumps, and even tracts of cedar forest in Lebanon, but perhaps there are no trees in the whole region equalling in size the largest of those forming the celebrated grove. Many thousand trees, besides young saplings, are found growing together in some places.

The cedar has been naturalized in Britain for over 200 years, having been introduced towards the end of the seventeenth century, and thrives as well in English parks as in its native mountains. In Scotland the first cedars were planted at Hopetoun House in 1740, and as tradition says, were brought thither by Archibald, duke of Argyll. The wood of the cedars grown on Mount Lebanon is much closer grained and darker in colour than that grown in Great Britain, which is too soft and spongy, and warps too easily to be well adapted for cabinet work. That the wood obtained from Mount Lebanon was well adapted for purposes of carpentry is evident from the extensive use made of it in the temple and other works of Solomon. It is, however, probable that under the generic name cedar several varieties of pine, cypress, and juniper were included. The wood of the cedar contains a considerable amount of resin, and its incorruptible qualities were well known to the ancients. A resin which exuded from the stem, called by the Romans *cedria*, was used for embalming the dead, and the leaves of papyrus when rubbed with cedar-oil were secure from the attacks of worms. The ancients preserved writings in cedar cabinets, but it would seem that such cabinets are unsuited for printed documents, owing to the property possessed by the wood of making the ink run. There are few better means of protecting furs and woollen fabrics from the attacks of moths than intrusting them to a wardrobe lined with cedar, or even placing beside them chips or shavings of cedar-wood. Probably this property of cedar-wood had something to do with its employment in the ancient Jewish ritual, as in the cleansing of lepers and the houses of lepers.

The deodar cedar (*Cedrus Deodara*) is a native of India, and is a large and handsome tree, growing in the Himalayas to the height of 150 feet, with a circumference of 30. It has wide-spreading branches, which droop a little at the extremities. The leaves are tufted or solitary, larger than those of the cedar of Lebanon, and very numerous, of a dark-bluish green, and covered with a glaucous bloom. The cones are rather larger than those of the Lebanon cedar, and very resinous. The wood is well adapted for building purposes, being compact and very enduring. The deodar was introduced into Great Britain in 1822, and is now common in lawns and parks. The Mount

Atlas cedar (*C. atlantica*), as its name implies, is a native of the mountains of North Africa. These three cedars, though differing in habit and minor features, are regarded by some botanists as specifically identical.

White cedar (*Cupressus thuyoides*), which is really a cypress, is a small or middle-sized evergreen, with leaves of a delicate green colour. It is a native of North America, China, and Cochin-China. In the United States it occupies large tracts denominated *cedar swamps*. The wood is soft, smooth, of an aromatic smell, and internally of a red colour.

A species of juniper (*Juniperus Virginiana*) gets the name of the red cedar in North America and the West Indies. The heartwood is of a bright red, smooth, and moderately soft, and is in much request for the outsides of black-lead pencils. It is often used for making drawers, presses, &c., because it resists the attacks of insects.

CEDAR LAKE, a lake of Canada, in the Saskatchewan district, a sort of expansion of the river Saskatchewan, receiving the waters of this large stream to pour them over the Grand Rapids into Lake Winnipeg. Between Grand Rapids and Cedar Lake is another expansion, known as Cross Lake. Cedar Lake is nearly 30 miles long, and where widest 25 broad; area about 312 square miles. Its depth of water is sufficient for the largest craft, except on the N.W., where the quantity of alluvium brought down by the Saskatchewan is rapidly filling it up. Both the mainland and the islands are well wooded with balsam spruce, birch, poplar, tamarack, Banksian pine, and cedar, the last growing on its shores, particularly the N.W., and from its being somewhat rare in other parts of the country, giving it its name.

CEDAR MOUNTAINS, a mountain range in Cape Colony, extending nearly along the meridian of 19° E., for about 25 miles southwards, beginning with lat. 32° S., and rising at some places to the height of 5000 feet. Fine cedar-trees of gigantic size formerly covered these mountains, and still do so to a considerable extent. These mountains contain many Bosjesman caves.

CEDILLA, a mark used under the letter *c* in French and Portuguese when the c stands before *a*, *o*, or *u*, to indicate that it is to be pronounced like the English *s*, not like *k*, as is usual before these letters. A *c* with the cedilla under it is written *ç*.

CEFALONIA. See CEPHALONIA.

CEFALU (ancient *Cephalœdis*), a seaport, Sicily, 39 miles E.S.E. of Palermo, with 14,173 inhabitants. It is surrounded by an old wall, is the see of a bishop, and has a very picturesque site at the foot of a precipitous rock. The trade is trifling, but an active and productive fishery is carried on. Sardines are caught in abundance.

CEHEGIN, a town, Spain, in the province and 39 miles W.N.W. of Murcia, 4 miles E. of Caravaca, on a declivity facing the S. It has numerous spacious streets, and two squares, lined with substantial houses and neat public buildings, comprising a parish church, three chapels, town and court houses, a prison, hospital, theatre, cemetery, and several schools. Manufactures—paper, cloth, soap, pottery, brandy, wine, and oil. Trade—grain, wool, hemp, silk, wax, cotton, &c. In the neighbourhood various quarries of jasper and variegated marble are wrought. Pop. (1887), 10,417.

CELÆNO. See HARPIES.

CELANO, TOMMASO DA, one of the reputed authors of the Latin hymn 'Dies Iræ,' was born towards the end of the twelfth or about the beginning of the thirteenth century, at Celano, in the Abruzzi, and died in Italy after 1250. He was one of the most devoted adherents of St. Francis of Assisi, and after the establishment of an order of Minorite friars on the Rhine he was appointed keeper (custos) of the Rhine districts. In 1230 he returned to Italy. He wrote a life of St. Francis, and several hymns. His claim to the authorship of the 'Dies Iræ' seems now pretty well established, but is still disputed in favour of Matthäus Aquasparta (died 1303), Cardinal Frangipani (died 1294), and even St. Bernard, Gregory the Great, and others. His name is first mentioned in connection with the poem towards the close of the fourteenth century. See DIES IRÆ.

CELEBES, one of the larger islands of the Indian Archipelago, between Borneo on the W. and the Moluccas on the E., extending from lat. 1° 45′ N. to 5° 52′ S., and from lon. 118° 45′ to 125° 17′ E., remarkable for the singularity of its shape. It consists mainly of four large peninsulas stretching to the E. and S., and separated by three deep gulfs. Of these peninsulas that of Menado on the N. sweeps N., then E., and lastly N.E. The whole length of this peninsula is about 400 miles, and its breadth varies from 12 to 60 miles. Its north-eastern portion, lying between 1° and 2° N. lat., is called Minahassa. The Peninsula of Bulante, on the E., is 160 miles long, and from 30 to 95 miles broad; the south-eastern peninsula has much the same length and breadth as the latter; and finally, the Peninsula of Macassar, on the S.W. of the island, forms a pretty regular parallelogram, lying N. and S., 200 miles long and 65 broad. The total area of the island is estimated at 54,000 square miles.

Celebes is high and mountainous chiefly in the centre and the north, where there are several active volcanoes. The absence of extensive deltas, and the intervention of broad grassy plains between the forests, distinguish it from the other larger islands of the Indian Archipelago. All that is most majestic and lovely in these is thought to be concentrated in Celebes. It abounds in the most picturesque and varied scenery, and the most beautiful and magnificent tropical vegetation. Though cut by the equator, and wholly within the torrid zone, Celebes is thought remarkably healthy, the natives often enjoying a vigorous old age, and Europeans living longer than anywhere else in the East. Its extreme heats are tempered by the sea-breezes, by monthly rains, and by the N. winds that prevail for part of the year. The E. monsoon lasts from May to November, and the W. during the remaining months. The soil generally consists of a bed of vegetable mould from 10 to 20 feet thick, on decomposing basalt. Gold is found in all the valleys of the north peninsula, which is often convulsed by earthquakes, and abounds in sulphur. Copper of good quality occurs at various points, and in Macassar tin also, as pure as that of Banka. Diamonds are sometimes found almost at the surface of the ground, and precious stones are carried down in the sand of the torrents. The island is entirely destitute of the large carnivorous animals and pachyderms. None of the cat kind from the tiger downwards haunts its forests; nor has it the elephant, the rhinoceros, or the tapir. Deer and wild hogs abound, together with the babyroussa and herds of antelopes. Pouched animals, unknown in the Sunda Islands, here first occur. There is a black tailless baboon or ape; and also a singular ruminating animal resembling both the ox and the antelope, called *anooang* by the natives, and *Anoa depressicornis* by zoologists. Among domesticated animals are found small but vigorous horses, buffaloes, goats, sheep, and pigs. Trepang and turtle are caught in abundance. Among the trees are the oak, teak, cedar, upas, bamboo, sacred *waranguin*, &c. Among plants requiring more careful cultivation, the coffee-tree, indigo, cacao, sugar-cane, manioc root, tobacco, &c. The maritime districts of Celebes are inhabited by Malays; the Peninsula of Macassar is occupied by Bugis and Macassars. Mandhars dwell in the W. of the island, and the mountainous regions in the interior, especially in the N., are inhabited by Alfoories. In the harbours also there are many Chinese and Oorang Badjus or Oorang Laut, a mixed race partly of Malay and partly of Battak origin, who live in their boats, and roam over the whole archipelago, gaining their livelihood by fishing. The natives are subject to several petty rulers, who are, however, more or less dependent on the Dutch. The capital is the town of Macassar, in the S.W. of the island, in the bazaar of which are sold all the products of the neighbouring islands as well as of Celebes itself, among which are bamboo canes, sandal-wood, cajeput oil, nutmegs, rice, coffee, pearls, birds'-nests, trepang, birds of paradise, &c. The trade in trepang is very important, Macassar being the chief staple place for this article of commerce. Not less than twenty different kinds are sold in the market, and in many years nearly 2,000,000 lbs., of the value of about £125,000, are exported to China. The chief harbour in the N. of the island is that of Kema, on the E. coast of Minahassa, about 30 miles from Menado, on the W. coast, where there is the chief bazaar in the N. of the island. The coffee of Menado is excellent, and is even preferred to the best Javanese coffee. A recent return states the number of coffee-trees in Minahassa at nearly 6,000,000 and the export of coffee at about 5,000,000 lbs. The harvest of cocoa-nuts is also considerable. Minahassa is said to be one of the richest and most beautiful regions on the face of the earth. Until 1833 the native inhabitants (Alfoories) lived in a state of complete barbarism, but in that year the Dutch took upon themselves the task of civilizing them, a task in which they have been very successful, and which reflects great honour upon them. The village chieftains were induced to take part in the cultivation of the coffee-tree, and received from the Dutch a certain official dignity. Coffee-beans for seeds were supplied from Java, from which island were also sent instructors and overseers. The labourers were provided with good nourishment; and the coffee was bought by the Dutch at a fixed price. Roads were made between the different villages, teachers were introduced, and Chinese traders brought in all kinds of wares. The inhabitants now became acquainted with some of the comforts of civilized life. They clothed themselves, built neat dwellings for themselves, to each of which are attached a small field for the cultivation of rice, and a vegetable garden with orange-trees, and supplied themselves with household utensils. A European controller superintends the cultivation of the coffee-tree in his own district, advises the village chieftains, acts as the protector of the natives, and negotiates between them and the Dutch government. The chief of each district, along with a council of elders, determines on what days of the week work is to be done. Books are kept showing how many hours each family has wrought, and after the harvest each family receives the share due to it.

The languages and literature of Celebes differ essentially from those of the countries to the W. The letters of its alphabet are in form as unlike the Javanese as the latter are unlike the Arabic or Roman. The three great languages of the island, not reckoning the dialects of the savage tribes, are those of the Bugis, the Macassars, and of Mandhar. The ancient Bugis is the language of science and religion, and is thought by some to be the mother tongue of the three. The modern Bugis is the most cultivated and copious; the Macassar is simpler, and its literature more scanty; both are distinguished for a soft and vocalic pronunciation. The Bugis have a considerable body of literature, consisting both of native tales, founded on national legends, and of translations of Malay and Javanese romances, and of works on law and religion from the Arabic.

With respect to religion, the Alfoories have their own vague superstitions. The more civilized inhabitants profess Mohammedanism; but previous to the introduction of that faith, the Hindus had brought their religion to the island, and the natives say that there are fine Hindu monuments in the interior that have not yet been visited by Europeans.

The island of Celebes was first visited by the Portuguese in 1512, but no factory was established by them there till a few years later. It is not known with certainty when the Dutch first visited the island, but the date may be fixed with a considerable amount of probability about the end of the sixteenth or the beginning of the seventeenth century. In 1607 the Dutch entered into commercial relations with Macassar. In 1611 the East India Company of the Netherlands acquired the sole right to trade in the island of Bouton, in the S.E. of Celebes; and in 1618 mention is made of a rising in Macassar, which resulted in the Dutch gaining a footing in the island. In 1660 Macassar was taken by the Dutch after a long resistance, the southern portion of the island put under Dutch rule, and the Portuguese expelled. In 1683 the northern part likewise fell into their hands. In 1703 Fort Amsterdam was built in Menado. The island was conquered by the British in 1811, but a few years later it was again given up to the Dutch, in whose possession it has remained ever since. The population is estimated at nearly 1,500,000.

CELERES. See Equestrian Order.

CELERY (*Apium graveolens*), an umbelliferous plant, which grows wild in many of the southern parts of Europe, and is not uncommon in the Isle of Thanet and other marshy spots of England near the sea. It has been greatly changed and improved by cultivation, and now presents numerous varieties, some of which are cut for salad, while others, including what is called the turnip-rooted sort, are much used for stewing or similar purposes. In soups the seeds may be used equally with the stems or leaves. The celery commonly grown in Great Britain is raised in beds, sown from March to May. A light rich and rather moist soil is best adapted for its growth, whilst one which is heavy, wet, and adhesive, is unfavourable to it. Although the plant requires plenty of water, yet it is apt to rot in winter in cold heavy soils saturated with moisture. Provided manure is at command, a poor light soil is better than one that is stiff and rich; for the growth can be made to depend chiefly on the manure supplied, and the plant grows better when its leaf-stalks are surrounded with light porous soil than when it is pressed against by that which is heavy and compact. From the seed-bed the plants are transferred to another bed where they remain till 6 or 7 inches higher, after which they are planted out either in *trenches*, a single row being planted along the middle; or in *broad beds*, with the plants in rows across. The largest celery is grown in trenches; and in cold retentive soils it is doubtless the best mode, as the ridge can be made to throw off the water in winter—an advantage which the flat-bed does not possess. On the other hand the bed system affords more heads from the same space of ground.

CELESTINE ($SrSO_4$), the native sulphate of strontium, occurs associated with sulphur and finely crystallized, in the Sicilian sulphur mines. Its primary form is a right rhombic prism, but various modifications are found. It is transparent and colourless, though specimens are met with of a yellow or red colour, while others are of a fine blue. It is from this variety that the mineral has obtained its name. It has a specific gravity of about 4, is not hard, and is brittle. It is somewhat widely distributed, being found in the south of France, in Germany, in America; and in this country, at Bristol and at Inverness. It is a principal source of strontium nitrate for red lights. Into the nitrate it is converted by heating with carbonaceous matter, decomposing the resulting sulphide with nitric acid, and crystallizing. See Strontium.

CELESTINE I. was elected pope in 422, and followed Boniface I. He was engaged in disputes on matters of discipline, first with the African bishops on matters of discipline and ecclesiastical jurisdiction, afterwards with the Pelagians of Britain, and lastly with the Nestorians in the East. He is supposed to have been a near relative of the Emperor Valentinian. The introit and other portions of the liturgy are attributed to him, but without any certainty on the subject. There is a decretal letter of this pope extant, directed to the Bishops of Vienna and Narbonne, prohibiting the bishops from wearing a dress distinguishing them from the people, and forbidding the choice of strangers for bishops, to the displeasure of their flocks. The consent of the people, of the clergy, and of the magistrate, he says, is necessary to a choice. He died April 6, 432, and is recognized by the church as a saint.

CELESTINE II., a native of Tuscany, who had studied under Abelard, filled the papal chair for five months in 1143-44. It was this pontiff who granted absolution to Louis VII. of France, and removed the interdict which for three years was laid upon that country.

CELESTINE III., one of the Orsini family, was elected pope in 1191, when, it is believed, about ninety years of age, and reigned till 1198. He crowned the emperor Henry VI., but afterwards excommunicated both Henry and Leopold, duke of Austria, on account of the captivity of Richard Cœur de Lion.

CELESTINE IV., a Milanese, who, when a monk at Hautecombe in Savoy, wrote a history of Scotland, was elected pope in 1241, but reigned only seventeen days, having died, it is said, of poison before the ceremony of consecration was performed.

CELESTINE V. was chosen pope July 5, 1294, before which time he was called *Peter of Morrone.* He lived as a hermit on Monte di Magella, in continual fasting and penance, and was entirely unfit for the Papal chair on account of his utter ignorance of business and of the world. He never would have been chosen had not the Papal chair been vacant for twenty-seven months, on account of the cardinals being divided into two parties. When Celestine entered Aquila he rode on an ass led by two kings. He soon found the burden of business too heavy, and abdicated his dignity Dec. 13, 1294. Boniface VIII. succeeded him, and kept him prisoner till his death, May 19, 1296. The greatest simplicity marks the government of this pope. He is the founder of the Celestines, and was canonized in 1313 by Clement V.

CELESTINES (from their founder Pope Celestine V., see above), the hermits of St. Damian, a religious order instituted about the middle of the thirteenth century, in Italy, followed the rule of St. Benedict, wore white garments with black capes and scapularies, and were devoted entirely to a contemplative life. In the beginning of the eighteenth century the order was diminished to the number of ninety-six monasteries in Italy, and twenty-one in France. This society of gloomy monks appears afterwards to have become still smaller. In France it no longer exists. The order had in the eighteenth century become so corrupt in that country that Louis XV. issued an edict requiring them to reform, and when they refused, the order was secularized by Clement XIV. and Pius VI. Their houses were suppressed, and their property sequestrated.

CELEUS. See Triptolemus.

CELIBACY of the Clergy.[1] One of the sublime ideas of the Catholic Church is its veneration of chastity. This was what placed Christianity in the most striking opposition to the sensual religions of the Pagan world. Whilst the Pagans lowered their gods to the human standard, Christianity directed men's views to heaven, and idealized human nature. St. Paul (1 Cor. vii.) recommends virginity, without condemning matrimony. The Catholic Church respects matrimonial chastity, but esteems virginity a higher virtue, as a sacrifice of the pleasures of this life to purity of soul, as the victory of the moral nature over the physical. With these sublime views of this virtue, it is not wonderful that it was required of the priests who officiate in the high mystery of the eucharist. From the time of the apostles it became a custom in the church for bishops, priests, and deacons to renounce the joys of matrimonial love at their consecration, and to devote themselves entirely to the duties of their office. One point only was disputed, whether clergymen were to be merely prohibited from marrying, or whether even those who were married before their consecration should be required to separate themselves from their wives. At the general council of Nice several bishops proposed that the bishops, priests, and deacons who had received the holy consecration, should be directed by an express ordinance to give up their wives. But Paphnutius, bishop of Upper Thebais, contended that cohabitation with a wife was a state of chastity. It was sufficient, he said, according to the ancient traditions of the church, that men in sacred orders should not be permitted to marry; but he who had been married before his consecration ought not to be separated from his lawful wife. As it became the general opinion that a clergyman could not marry, it soon became the general practice to refuse consecration to married men. By this means uniformity was effected. As for the bishops, it soon became a matter beyond dispute. After the institution of monachism had become firmly established, and the monks were regarded with veneration, on account of their vow of perpetual chastity, public opinion exacted from the secular clergy the same observance of celibacy. The holy father Epiphanius assures us that by the ecclesiastical laws celibacy was commanded, and that wherever this command was neglected it was a corruption of the church. The particular council of Elvira commanded all bishops, presbyters, deacons, and sub-deacons to abstain from their wives, under penalty of exclusion from the clergy. In the Western Church celibacy was rigorously required. Pope Siricius, at the end of the fourth century, forbade the clergy to marry, or to cohabit with their wives if already married. At the same time the monks received consecration, which increased the conformity between them and the secular clergy still further, and indirectly obliged the latter to observe celibacy. Several popes and particular councils repeated this injunction. The Emperor Justinian declared all children of clergymen illegitimate, and incapable of any hereditary succession or inheritance. The Council of Tours in 567 issued a decree against married monks and nuns, declaring that they should be publicly excommunicated, and their marriage formally dissolved. Seculars, deacons, and sub-deacons, who were found to dwell with their wives, were interdicted the exercise of spiritual functions for the course of a year. In Spain the bishops were ordered to enforce celibacy upon their abbots, deacons, &c., once a year in their sermons; for in that country many priests, formerly Arians, and newly converted, refused to give up their wives, conformably to the requisitions of the Catholic Church.

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[1] The above article, written by a Catholic, presents the views entertained on the subject of celibacy by the members of that communion. Protestants hold, that there is no moral superiority in celibacy over marriage; that vows of perpetual celibacy are unlawful, because there is no divine promise of grace to keep them, and consequently that the church has no right to impose such an obligation on any class of her ministers. See Augsburg Confession, art. xxiii.; Apology of Augsburg Conf., ch. xi.; Church of England, art. 32; Westminster Confession, ch xxii. § 7, and xxiv. § 3.

As in other points of discipline, in this also the Greek Church dissented from the Roman. The (Trullan) Council of Constantinople, in 691, in its thirteenth canon, declares, 'We hereby forbid any one to refuse the consecration of a priest or deacon on account of his being married, and cohabiting with his wife after he has requested consecration. We will by no means be unjust to marriage, nor separate what God has united.' This regulation is still in force. Celibacy is indeed required of the bishops and monks, but priests and deacons, if married before ordination, are allowed to continue in this state. They cannot marry after ordination.

The Roman Church, then, has retained celibacy as an old apostolical tradition, to which she has added the rule not to consecrate married men unless the wife enter a religious order. As no one has a right to demand to be consecrated a priest, the Roman Church has, by this addition, violated no one's right. Her position, therefore, is expressed by saying that, profoundly convinced that an unmarried clergy is best suited to her work, she admits to her ministry only those who voluntarily engage to lead a celibate life, and as long as she finds a sufficient number of such candidates she refuses to hamper her work by the employment of others. The Western Church had new reasons for enjoining celibacy, when the system of benefices began to be organized. At first the officers of the church lived on the voluntary gifts of the faithful. When the church acquired wealth, lands, and tithes, the revenue and estates of all the churches belonging to the diocese of a bishop were considered as one whole, the administration and distribution of which depended on the bishop. But in the seventh, eighth, and ninth centuries a particular sum was taken from the common stock for each officer, the bishop not excepted. This constitution of the church was similar to that of the state, in which feudatories performed military and other services in consideration of the usufruct of certain lands. Even the name was the same. The possessions of the feudatories were called *benefices*, as well as those of the clergy. If the clerical benefices and employments had become hereditary, as was the case with the lay benefices, we should have seen a hereditary ecclesiastical caste similar to that of the nobility, which has been transmitted to us from the middle ages as a caste of warriors and civil officers. We should have seen hereditary priests, hereditary bishops, and a hereditary pope. When the canons in Wales afterwards abandoned celibacy, it was soon observed that they had succeeded in making their benefices hereditary by intermarriages between their sons and daughters. The fate of Wales would have been that of all the Christian nations of the West if the marriage of priests had been allowed.

Whilst, however, the church persevered in commanding celibacy, she had to struggle with the opposition of a corrupt clergy. A reformer appeared in Gregory VII., who, like all men of great genius, has a right to be judged in reference to the spirit of his age. In order to reform the corrupted discipline of the church, he was obliged to encounter the simony and licentiousness of the clergy. The former he checked by opposing the emperor's right of investiture, and enforced the laws of celibacy by new regulations. In the Council of 1074, at Rome, he ordered that all married clergymen and all laymen who should confess to them, hear mass of them, or be present at any divine service performed by them, should be excommunicated. This met with much opposition, but in spite of that Gregory succeeded, as he was supported by the most ancient and most undoubted canons. After Gregory's decease the church continued in the same course.

The rule of celibacy has been more strictly observed in the Catholic Church since the Reformation than it was before. Hence few such public scandals have occurred as in former times, and transgression has been followed by immediate punishment. Yet, in such a vast number of clergy, violations of the vow of chastity from time to time are not wanting. Such transgressions are to be expected, particularly at a time when so many circumstances tend to increase the influence of luxury; yet the far greater number of the Catholic clergy respect the rule of celibacy at the present day. Among the reasons sometimes urged against requiring celibacy in the clergy, is the scarcity of men willing to devote themselves to a profession which requires such strict self-denial. This, however, is alleged to be not true in point of fact; statistics both in the United Kingdom and on the Continent are said to show a marked increase in the number of candidates for the priesthood at the present time.

CELL, a small chamber; the dwelling of a hermit; a lesser or subordinate religious house dependent upon a greater, by which it was erected, and under whose government it remained. The apartments or private dormitories of monks and nuns are also called *cells*.

Cell is also a term applied to the elementary portions of animals and plants. The fibres, tubes, &c., commonly observed in animal and vegetable tissues are not ultimate forms, but are themselves built up of smaller and mostly microscopic parts, which, though variously modified in different cases, may all be reduced to a general type, that of the cell. The typical cell is a globular body, having a membranous envelope, inclosing fluid or gelatinous matter, in which rests a smaller cell called the *nucleus*, and inside of which again there is a granular body called the *nucleolus*. The bodies of many of the lower animals and plants consist of an aggregate of such cells, or even of a single cell, living by and for itself. Plant cells, in their simplest form, differ little in appearance from those of animals; but in their contents, and especially in their ultimate destination, there is much difference. The plant-cell retains the character of a cell, but the animal-cell, when developed into tissues, often loses the character of a cell entirely. The contents of the former are such as chlorophyl (the green colouring matter of plants); fixed oils, as palm, linseed, and others; volatile oils, gums, resins, &c.; but the most important of all is starch, which forms so large a portion of the food of the human race. Among the contents of the latter are the substances known as protein bodies, alkaline and earthy salts; hæmatine, or the red colouring matter of the blood; fat, milk, sugar, &c. The wall of vegetable cells is composed of two layers, an inner, called the 'primordial utricle,' as being first formed, a thin and delicate membrane of albuminous constitution; and an outer protecting layer, which is thick, strong, and chiefly composed of cellulose, a starch-like substance, containing no nitrogen. The animal cell, on the other hand, has no cellulose wall, but only an albuminous membrane surrounding its contents. Fungi, lichens, and algæ are composed of simple cells, which are globular in the lowest forms, and elongated in the higher; and flowering plants, with all their complicated structure of spiral vessels, tubes, fibres, &c., are simply composed of more or less modified cells. A very common method of increase in vegetable cells is by division into two, each portion getting half the original nucleus, and becoming a perfect cell by itself. Animal cells grow mostly by development of new cells in the interior of the old, the nucleus dividing into a number of parts corresponding to the number of the new cells. This is the process by which the ovum—which is merely a nucleated cell—grows into the perfect animal, with its different tissues. The hair, teeth, nails, and bones are all composed of metamorphosed cells. The nucleated cell performs very important functions in the animal and vegetable economy. Glandular secretion is carried on by nucleated cells, which incorporate the proper elements, and by their rupture discharge their contents into the glandular ducts. The absorption of the chyle is effected in the same way.—*Cell* is also applied to various small cavities, such as the air-cells in the lungs.

CELLA. See Temple.

CELLAMARE, Antonio Guidice, Prince of, born at Naples in 1657, was educated at the court of Charles II. of Spain, and took a prominent part on the Spanish side in the war of Succession. In 1707 he was taken prisoner by the Imperialists, and detained five years in Milan. On obtaining his liberty he returned to Spain, commenced a diplomatic career, and in 1715 was appointed ambassador extraordinary at the French court. Here, having entered into Alberoni's scheme, he became head of a conspiracy for supplanting the regent, Philip of Orleans, and appointing Philip V. regent of Spain and France. The plot was discovered, and Cellamare was marched off under a guard to the Spanish frontiers. He was afterwards made captain-general of Old Castile, and held the office at his death at Seville, in 1733. A romance of Vatout, entitled the Conspiracy of Cellamare, gives an account of the conspiracy with tolerable accuracy.

CELLARDYKE, a fishing village on the S.E. coast of Fife, between Anstruther-Easter and Kilrenny. It forms an eastern extension of the former, but is united as a royal burgh to the latter. The fishermen use the new Union Harbour in Anstruther. The inhabitants are chiefly engaged in or connected with the fishing industry; the village contains three fishing-gear factories and also oil-skin works. The population in 1891 was 1662.

CELLARIUS, Christoph, one of the most learned philologists of the seventeenth century, was born in 1638. After he had studied at several German universities, he taught moral philosophy and the oriental languages at Weissenfels. In 1673 he was made rector of the school at Weimar, and afterwards of the seminaries at Zeitz and Merseburg, and finally professor of eloquence and history at Halle, where he died in 1707. He published a great number of ancient authors, with learned annotations and very accurate indexes, as, for instance, the letters of Cicero and of Pliny, Cornelius Nepos, Curtius, Eutropius, Setus Rufus, Velleius Paterculus, the twelve ancient panegyrists, Minucius Felix, Silius Italicus, &c. His own compositions relate to ancient history and geography, Roman antiquities, and the Latin language.

CELLE, a town in Prussia, in the province of Hanover, landdrostei of Lüneburg, and 23 miles N.E. of the town of Hanover. It stands in the midst of a sandy plain, at the confluence of the Fuse with the Aller, and on a railway communicating with Hanover and Hamburg. It is well built, contains a royal palace, with a fine chapel and a garden, in which a monument has been erected to Matilda, the sister of George III., the unhappy Queen of Denmark, who died here. It has also a well-known penitentiary. On account of the Higher Court of Appeal which has existed there since 1711, Celle is sometimes called the Hanoverian Wetzlar. The woods around Celle are remarkable for the number of nightingales that assemble there in summer. The manufactures consist chiefly of linen, flannel, hats, and tobacco; and the trade with Bremen and other places is extensive. The British sovereigns are descended from one of the Dukes of Celle. Pop. (1895), 19,438.

CELLINI, Benvenuto, a sculptor, engraver, and goldsmith, distinguished particularly by his works in gold and silver, which have become very rare, and are sold at present at immense prices. He was born at Florence in 1500, and died there in 1571 or 1572. Of a bold, honest, and open character, but vain and quarrelsome, and impatient of encroachment and dependence, he was often entangled in quarrels which frequently cost his antagonists their lives. He himself incurred great dangers, was put into prison, and was saved only by his boldness and the powerful protectors whom his talents as an artist procured him. At the siege of Rome (if we believe his own account, given in his autobiography) he killed, with one cannon shot, the Constable of Bourbon, and with another, the Prince of Orange. He was afterwards imprisoned on the charge of having stolen the jewels of the Papal crown, which were intrusted to him during the siege, and was released only by the interference of Francis I., whose court he visited. While there he executed several works. He afterwards returned to Florence, and under the patronage of Cosmo made a Perseus with the head of Medusa in bronze, which is still an ornament of the market-place; also a statue of Christ, in the chapel of the Pitti palace, besides many excellent dies for coins and medals. His works may be divided into two classes. The first, for which he is most celebrated, comprises his smaller productions in metal, the embossed decorations of shields, cups, salvers, ornamented sword and dagger hilts, clasps, medals, and coins, in which he showed great skill in composition, and excellence in the details of execution. The second includes his larger works as a sculptor, such as the bronze group of Perseus, with the head of Medusa, mentioned above; a colossal Mars for a fountain at Fontainebleau; a marble Christ in the Escurial Palace; a life-size statue of Jupiter in silver; a bronze bust of Bindo Altoviti, &c. His life, written by himself, is a production of the utmost energy, directness, and racy animation. The vanity and self-satisfaction displayed throughout the work are excessive and highly amusing. It not only contains very full information respecting his life and professional pursuits, his amours and hatreds, his passions and delights, his love of art, his extravagances, his self-applause and self-assertion, and describes all ranks of persons with whom he was connected during his strange career, but furnishes a very lively and doubtless a tolerably accurate picture of the state of society during the sixteenth century. This work has been translated in a masterly manner by Goethe into German. There is also an English translation by Dr. Nugent (1771), revised by Thomas Roscoe (1822); but this has been superseded by that of J. A. Symonds (1887). Among his other writings the most important are Due Trattati, uno intorno alle Otto Principali Arti dell' Oreficeria l'altro in Materia dell' Arte della Scoltura (best edi tion, 1781). His Opere were published at Florence in 1843. His style is free, strong, and original, and the Academy della Crusca often quotes him as a classic.

CELLULAR, the common name of an animal tissue, which is better called reticular, areolar, or connective. Any person may gain a general notion of this substance by observing it in joints of veal, when it is inflated by the butchers. It consists of an assemblage of fibres and *laminæ* of animal matter connected with each other so as to form innumerable small cavities, from which its name of *cellular* is derived. It pervades every part of the animal structure. It joins together the minute fibrils of muscle, tendon, or nerve, and surrounds these when collected into large *fasciculi* or bundles. It joins together the individual muscles, and is collected in their intervals. It surrounds each vessel and nerve in the body, often connecting these parts together by a firm kind of capsule, and, in a looser form, joining them to the neighbouring muscles, &c. In consequence of its partial solution by the united agencies of heat and moisture, the muscular fibres separate from each other, and from the other structures of the body. This effect is seen in meat which is subjected to long boiling or stewing for the table, or indeed in a joint which is merely over-boiled. It forms a connection and passage between all parts of the body, however remote in situation or dissimilar in structure; for the cavities of this substance everywhere communicate, as we may collect from facts of the most common and familiar occurrence. In emphysema, where air escapes from the lungs wounded by a broken rib into the cellular substance, it spreads rapidly from the chest into the most remote parts of the body, and has even been known to gain admission into the eye-ball. A similar diffusion of this fluid may be effected by artificial inflation.

CELLULOID, an artificial substance extensively used as a substitute for ivory, bone, hard rubber, coral, &c., having a close resemblance to these substances in hardness, elasticity, and finish. It is composed of cellulose or vegetable fibrine reduced by acids to gun-cotton. To this, camphor is added, with the required colouring matter, and the mixture after being condensed in cylinders, is then moulded by heat and pressure into various useful and ornamental articles.

CELLULOSE ($C_6H_{10}O_5$ or a multiple) is the constituent of wood-cells, and in this way forms the greater part of wood. It is accompanied in the wood by a variety of substances, colouring matter, resin, &c., so that pure cellulose is hardly met with in nature, and is somewhat difficult to prepare artificially. It exists, however, very pure in dressed cotton or linen, and in paper. It is a white insoluble tasteless substance, not readily acted on by weak chemical reagents. Treatment with strong sulphuric acid converts it first into a body like dextrin, and by prolonged digestion into grape sugar; but if the acid be previously mixed with about half its bulk of water, and then the cellulose, for example a piece of paper, be dipped in it for a brief period, and afterwards well washed, it is found to have become tough and translucent, and to have been converted into what is called parchment paper. Very strong nitric acid converts cellulose into gun-cotton. Cellulose has the same percentage composition as starch, but differs from it entirely in its properties.

CELSIUS, the name of a Swedish family, several members of which attained celebrity in science and literature. MAGNUS CELSIUS was born in the old province of Helsingland in 1621, and became professor of mathematics in the University of Upsal. He published two works on the antiquities of his native province and was the discoverer of the Helsing runes. Besides mathematics and archæology, he cultivated poetry with some success, and was so skilled in practical mechanics that he himself made all the scientific instruments he required in his astronomical observations, &c. He died in 1679. His son NILS CELSIUS, born 1658, died 1724, also filled the mathematical chair in Upsal University. OLAF CELSIUS, another son of Magnus, was born in 1670. He early became famous as an earnest student of the oriental languages and of botany. He was successively appointed to the chairs of Greek, oriental languages, and theology, and filled the office of provost of the cathedral at Upsal. He devoted a good deal of attention to the study of runology, and was among the first to recognize the genius of Linnæus whom he liberally patronized. In 1745–47 he published his voluminous work Hierobotanicon, a description of all the plants mentioned in the Bible. He died in 1756. ANDERS CELSIUS, son of Nils Celsius, and the most distinguished of the family, was born 27th Nov., 1701. After being appointed professor of astronomy at the University of Upsal he travelled in Germany, England, France, and Italy; and in 1736 he took part in the famous expedition which was undertaken by Maupertuis, Clairaut, Camus, and others, for the purpose of measuring a degree of the meridian in Lapland. For his services in this expedition he received a pension from the French king. He is best known at the present day as the constructor of the Centigrade thermometer. (See CELSIUS SCALE.) He died 1744. OLAF CELSIUS the younger, son of the orientalist and naturalist, and cousin of the preceding, was born in 1716. He became Bishop of Lund, and devoted himself to history and poetry. His principal historical works are an Ecclesiastical History of the Kingdom of Sweden; History of Gustavus I.; History of Erik XIV., &c. He died 1794.

CELSIUS SCALE, another name for the Centigrade thermometric scale. The name is from that of the inventor, Anders Celsius, who about 1741 attempted the precise graduation of thermometers. He took the melting-point of ice as 0°; and the boiling-point of water, under standard atmospheric pressure, as 100°. See also THERMOMETER.

CELSUS, an Epicurean philospher of the second century, who is usually said to have been the author of a work against the Christians, which is now lost, but is mostly preserved in the extracts contained in the more celebrated work *Contra Celsum*, in which it was answered by Origen. In this refutation Origen had adopted the plan of going through the treatise of Celsus in regular sequence, taking one passage after another in the order in which he found them in the book. He has not adhered to this rule with absolute fidelity, but his deviations from it are few, and as he generally quotes the exact words, a large portion of the treatise has thus come down to us. The work, however, contains many views that are not Epicurean but Platonic, from which it has been inferred by some that Celsus the Epicurean and Celsus the Platonist were different persons. Celsus labours especially to throw ridicule on the great doctrine of the resurrection of the body, but his knowledge of Christianity is very unsatisfactory. As to his personal history nothing whatever is known, Origen himself being very much in the dark as to who Celsus was and when he lived.

CELSUS, AURELIUS (or perhaps AULUS) CORNELIUS, a celebrated Latin writer on medicine who lived, probably, under the reigns of Augustus and Tiberius. He has been called the *Roman Hippocrates*, because he imitated the Greek physician, and introduced the Hippocratic system into Rome. He also wrote on rhetoric, the art of war, and agriculture. He is however, best known as a medical writer. His style is elegant, and though concise, is very perspicuous. His work on medicine is an inexhaustible source from which other authors have drawn materials. Many editions of his eight books *De Medicina* have appeared; the first at Florence, 1478, fol. There is an English translation by Dr. Grieve (1756), and an edition, Latin and English, by Alex. Lee (1831). The edition by Védrènes (Paris, 1876) contains a French translation.

CELTÆ. See Celts (the people).

CELTIBERI, or Celtiberians, the ancient inhabitants of Celtiberia, a country intersected by the Iberus (Ebro), in the N.E. part of Spain. They formed the most numerous tribe in Spain, and originated from Iberians mixed with Celts. They were brave, and their attack was formidable even to the Romans. After a long resistance to the Romans they were at last, in the Sertorian war, subjected to their sovereignty (about 70 B.C.), and adopted their manners, language, dress, &c.

CELTS, or Kelts, the earliest Aryan settlers in Europe according to the common theory. They appear to have been driven westward by succeeding waves of Teutons, Slavonians, and others, but there are no means of fixing the periods at which any of these movements took place. Herodotus mentions them as mixing with the Iberians of Spain. (See Celtiberi.) At the beginning of the historic period they were the predominant race in Britain, Ireland, France, Belgium, Switzerland, N. Italy, Spain, and elsewhere. The Romans generally called them Galli, but also Celtæ. They appear to have reached the zenith of their power in the second and third centuries B.C. Some tribes of them, overrunning Greece, crossed over in 278 B.C. to Asia Minor, and subsequently the name of Galatia was given to the country where they settled, from their name in Greek—*Galatai* (*Keltoi* being also used). They finally went down before the resistless power of Rome, and either became absorbed with the conquering races or were cooped up in the remotest parts of their former domains. At an early date the Celts divided into two great branches, speaking different though allied languages. One of these branches is the Gadhelic, Goidelic, or Gaelic, represented by the Highlanders of Scotland, the Celtic Irish, and the Manx of the Isle of Man; the other is the Brythonic or Cymric, represented by the Welsh, the Cornish, and the inhabitants of Brittany. The Cornish dialect is now extinct. The sun seems to have been the principal object of worship among the Celts, and groves of oak and the remarkable circles of stone, commonly called 'Druidical Circles', their temples of worship. All the old Celts seem to have possessed a kind of literary order called Bards. The ancient Irish wrote in a rude alphabet called the Ogham; later they employed the Roman alphabet, or the Anglo-Saxon form of it. The chief ancient literature existing consists of hymns, martyrologies, tales and legends, biographies, annals, and laws written from the ninth to the sixteenth centuries. The Scottish Gaelic literature, which is comparatively modern and unimportant, includes a collection of manuscripts in the Advocates' Library, Edinburgh, some of which date from the twelfth century; the Book of the Dean of Lismore, sixteenth century; a number of songs from the seventeenth century to the present day; and the so-called poems of Ossian (which see). The Welsh literary remains date from the ninth century, and consist of glossaries, grammars, annals, genealogies, histories, poems, prose tales, &c. The old Breton literature includes two miracle-plays, a dictionary, two cartularies, a prayer-book, &c. Celtic art is known to us chiefly in the many ornamented articles in bronze and other metals which have been preserved, and in several splendidly illuminated manuscripts of the gospels. The earlier specimens are characterized, among other things, by a predominance of elliptic curves and diverging spirals, and their style seems to have been of purely British origin and use. The introduction of Christianity led to a great advance in the ornamentation of metal and other articles, but the chief relics of Christian Celtic art are the magnificent manuscripts above referred to. Their dates range from the seventh to the ninth century, and the finest of them are the Book of Kells (Trinity College, Dublin) and the Lindisfarne Gospels (British Museum). Specimens of Celtic metal and other ornamentation are to be seen in our chief museums. See also Wales, Ireland, Scotland, Gael, Gaul, Ethnology, Philology, &c.

CELTS, the name given to ancient weapons or implements of stone or bronze resembling axes, adzes, or chisels, and found over nearly the whole surface of the earth. The derivation of the word is uncertain, and there seems to be no reason whatever to connect the word with the name of the Celtic people. Stone celts are popularly believed in many countries to be thunder-bolts. Hence in different parts of Great Britain they are known as 'thunder-axes', 'thunder-bolts', &c.; and they are still, or have been known by similar names in France, Germany, Italy, Denmark, Greece, Japan, Burmah, and numerous other places. Even the learned did not refuse their countenance to this vulgar error. Connected with this curious belief as to the origin of these stones, there were various superstitions almost equally widespread, such as those regarding their efficacy against lightning and their medicinal virtues. Somewhat similar beliefs were connected with the equally common flint arrow-heads. (See Elf-arrows.) Stone celts are found in the form of hatchets, adzes, or chisels. Some are only about 1 inch in length, whilst others approach 2 feet; but the most common length is from 6 to 8 inches, and the breadth is usually about ½ or ⅓ of the length. The materials of which they are made are flint, chert, clay-slate, porphyry, various kinds of greenstone and of metamorphic rocks, and, in short, any very hard and durable stone. Some are found merely chipped into shape; others have the edge ground and polished, although the other parts are merely chipped; and there are others which have the whole surface ground and polished. These stone celts belong to the Stone Age of archæologists, the ruder class being regarded as taking their origin in the earlier or *Palæolithic* period, the more perfect in the later or *Neolithic* period; while the bronze celts belong to the much more recent Bronze Age. Celts that are merely chipped appear to be more common in flint than in any other material. Two good reasons are given for this: first, that most other stones are more easy to grind than flint, and second, that it is more easy to give the proper form to flint than to almost any other stone merely by chipping.

There were two chief methods by which stone celts were attached to their handles. One was to insert the celt tightly in a hole made in the handle. The other was to insert the handle in a hole in the celt. Celts which have such holes to admit the handle are called perforated celts, and many axe and hammer heads have been found of this form. Sometimes instead of a hole being cut right through the handle for the admission of the stone, there was merely a socket made in the wood in which the celt was firmly fastened by means of some kind of binding. Instead of wooden handles, stags' horns seem often to have been used, and such are sometimes found with sockets at the end, evidently intended for the reception of small celts.

At various places remains have been discovered which indicate pretty clearly that at these spots the manufacture of celts was anciently carried on. Evidences of the existence of such manufactories are to be seen in the neighbourhood of the Pfahlbauten of Moosseedorf in Switzerland, at the confluence of the Leochel and the Don in Aberdeenshire, at Cissbury, near Worthing, at Grime's Graves, near Brandon, at Spiennes, near Mons, in Belgium, and many other places. At the last-mentioned place the manufacture was carried on on a very large scale, and the shafts and galleries which were excavated in order to come at the flint necessary for the manufacture are still to be seen. Sometimes, however, the manufacture was carried on at places where the flint or other material out of which the celts were made was not to be had, such, for example, as the one mentioned in Aberdeenshire, and this proves flint to have been among the earliest articles of commerce. The blocks of flint would be imported as the raw material to those manufactories, and then exported again in the form of manufactured celts. The remains found at these ancient manufactories leave little doubt that the process of manufacture must have been much the same as that by which gun-flints are still manufactured. In the first place, a piece of flint of such a size as can be conveniently held in the hand is broken off a large block of the material, and its sides are made as plane and even as possible. This piece is then held in the left hand, and a hammer is used to strike off, by sudden and sharp blows, successive flakes of the flint of the thickness required. The hammers used by the primitive celt manufacturers appear generally to have been of a different material from that which was used to make the celt. Experiments have shown that by a little practice one is able to strike off as good flakes with a pebble for a hammer as with the 'flaking' or 'English' hammer used by modern manufacturers. The flakes having thus been broken off the piece of flint, were then chipped and ground down to any form. The external flakes, that is, those first struck off by the hammer, and the pieces of flint left after all the flakes had been struck off, were thrown away as refuse; and such fragments are found in abundance at the ancient manufactories which have been discovered.

Bronze celts belong to a later period than stone ones, and are not so numerous. Some stone celts, however, have been found along with bronze celts in such a manner as to show that stone celts were still used when the method of working bronze had been discovered, a circumstance that need not be wondered at. Bronze celts are not found so large as the largest stone celts, the largest bronze celt being under 1 foot; but the average size of a bronze celt is about the same as that of a stone, namely, about 6 inches. In form they are more various than stone ones, as also in the mode of attachment, although the two chief modes of attachment are the same in bronze as in stone celts. Examples of both stone and bronze celts are to be seen in the British Museum, the Antiquarian Museum at Edinburgh, the Museum of the Royal Irish Academy at Dublin, and elsewhere. (On the subject of stone celts consult Ancient Stone Implements of Great Britain, by Sir John Evans, F.R.S., &c. (London, 2nd ed., 1897), from which most of our information has been taken.)

CEMENTATION, a chemical process in which a metal is placed in connection with other substances, usually in layers (*stratum superstratum*), in close vessels, and heated to a high temperature, in order that it may be separated from other metals mixed with it, or changed in some other way. The substance with which the metal or other body is surrounded is called *cement-powder*. In cementing gold, the alloy is beaten into thin plates, and placed in alternate layers with a cement containing nitrate of potassium, or common salt, with sulphate of iron and powdered bricks. The whole is then exposed to heat, until a great part of the alloying metals are removed by the action of the nitric acid liberated by the nitre or the chlorine from the salt. Iron is cemented with charcoal powder and other substances, and thereby converted into steel. (See STEEL.) Glass is changed by cementation with gypsum into Reaumur's porcelain. Copper is cemented with a powder of calamine and charcoal, and thereby converted into brass. The copper obtained from the sulphate of copper by precipitation with iron is called *cement-copper*. The peculiarity of this process is, that the action appears to take place between bodies in the solid state. This, however, is probably only in appearance; still, the action in certain cases is not quite understood.

CEMENTATION OF STEEL. See STEEL.

CEMENTS, the substances used for producing cohesion between different materials are very numerous and various. They are mostly soft or semi-fluid, and harden in the course of time. The thinner the stratum of cement, the firmer it will hold. The joints of iron pipes and the flanges of steam-engines are cemented with a mixture composed of sulphur and sal-ammoniac, together with a large quantity of iron chippings. The putty of glaziers is a mixture of linseed-oil and powdered chalk. Plaster of Paris, dried by heat, and mixed with water, or with rosin and wax, is used for uniting pieces of marble. A cement composed of brick-dust and rosin or pitch is employed by turners and some other mechanics to confine the material on which they are working. Common paint, made of white-lead and oil, is used to cement China ware. So also are resinous substances, such as mastic and shell-lac, or isinglass dissolved in proof-spirit or water. The paste of bookbinders and paper-hangers is made by boiling flour. Rice-glue is made by boiling ground rice in soft water to the consistence of a thin jelly. Wafers are made of flour, isinglass, yeast, and white of eggs dried in thin layers upon tin plates, and cut by a circular instrument They are coloured by red-lead, &c. Sealing-wax is composed of shell-lac and rosin, and is commonly coloured with vermilion. Common glue is most usually employed for uniting wood and similar porous substances. It does not answer for surfaces not pervious to water, such as metals, glass, &c. The cements mostly used in building are composed of lime and sand. Lime is procured by burning substances in which it exists in combination with carbonic acid, such as limestone, marbles, chalk, and shells. By this process the carbonic acid is driven off, and quicklime is obtained. The quicklime is slaked by mixture with water, after which it swells and cracks, becomes hot, and assumes the form of a white and impalpable powder. This is a hydrate of lime, and contains about three parts of lime to one of water. When intended for mortar, it should be immediately mixed with sand, and used without delay, before it imbibes carbonic acid anew from the atmosphere. The lime adheres to and unites the particles of the sand. Cements thus made increase in strength and solidity for an indefinite period. Fresh sand, wholly silicious and sharp, is the best. That taken from the sea-shore is unfit for making mortar, as the salt present is apt to deliquesce and weaken the mortar. The amount of sand is always greater than that of the lime. From two to four parts of sand are used, according to the quality of the lime and the labour bestowed on it.

Water cements, called also *Roman cements*, harden under water, and consolidate almost immediately on being mixed. Common mortar dissolves or crumbles away, if laid under water before it has had time to harden; but certain rocks, which have an argillaceous as well as a silicious character, communicate to lime or mortar the property of hardening in a very few minutes, both in and out of water. The ancient Romans, in making their water cements, employed a peculiar earth, obtained at the town of Puteoli. This they called *pulvis Puteolanus*. It is the same that is now called *Puzzolana*. It is evidently of volcanic origin. The Dutch, in their great aquatic structures, have mostly employed a substance denominated *tarras*, *terras*, or *trass*, found near Andernach, in the vicinity of the Rhine. It is said to be a kind of decomposed basalt, but resembles Puzzolana. It is very durable in water, but inferior to the other kinds in the open air. Some limestones, calcined and mixed with sand and water, also afford water cements, usually in consequence of containing some argillaceous earth. *Portland Cement* (which see) is made by mixing chalk and clay, in certain proportions, with water, then drying and burning the mixture in kilns, and grinding to powder. It is the strongest cement in use, but it sets slowly. Some cements, known as *maltha* or *mastic*, of great hardness and permanency, have been obtained from mixtures into which animal and vegetable substances enter, such as oil, milk, mucilage, &c. They are not much used.

CEMETERY. *See* BURYING-PLACES.

CENCI, BEATRICE, called the *beautiful parricide*, was the cause of the extermination of the noble family of Cenci. Muratori, in his Annals (vol. x. part 1, 136), relates the story as follows:—Francesco Cenci, a noble and wealthy Roman, after his second marriage, behaved towards the children of his first marriage in the most shocking manner, procured the assassination of two of his sons, on their return from Spain, by banditti, and, what is still more horrid, seduced and debauched his youngest daughter Beatrice, a maiden of singular beauty. She discovered this shocking crime to her relatives, and even sought to obtain protection from Pope Clement VIII. It appears, however, that this was not granted: for, when the guilty father continued his former treatment with aggravated wickedness, she joined with her brother Giacomo, and hired two assassins, who put the monster to death as he slept. The guilty parties were discovered, confessed the murder on the rack, and were condemned by the pope to be torn to pieces by horses. In vain did the learned Farinaceus (celebrated for his Quæstiones) exert himself to obtain a mitigation of their punishment by a lively representation of the depravity of the deceased, Sept. 9, 1598. According to other accounts, Beatrice and her relatives appear to have had little or no share in the murder of the old Cenci; but a tissue of villany and baseness gained belief to the false testimony of two banditti against the Cenci family. So much is certain, that, Sept. 11, 1599, Beatrice Cenci and her stepmother were executed with a sort of guillotine called *mannaia*. Giacomo was killed with a club; the younger brother was pardoned on account of his youth; but the estates of the family, to which belonged the Villa Borghese, since so famed for its treasures of art, were confiscated, and in 1605 presented by the reigning pope, Paul V., of the house of Borghese, to his family. In the Barberini Palace at Rome, travellers are shown an excellent painting, said to be by Guido Reni, as the portrait of the unfortunate parricide; but this is now controverted, and recent investigations tend to show that the popular version of the whole story is far from the true one. Shelley has made the Cenci the subject of a drama.

CENIS, MOUNT, a mountain belonging to the Graian Alps, between Savoy and Piedmont. Its height is stated to be 11,755 feet above the level of the sea. It is famous for the winding road constructed by Napoleon I. which leads over it from France to Italy. (*See* ALPS—ROADS OVER.) On the mountain is a plain and a lake, with a hospice for travellers. The lake contains trouts of 16 lbs. weight. The plain is surrounded by higher peaks covered with snow. Mount Cenis has attracted a considerable amount of attention throughout Europe on account of the immense railway tunnel which takes its name from it, and which after nearly fourteen years' labour was brought to completion in 1871. The idea of constructing such a tunnel in order to facilitate the intercourse between France and Italy was one which early suggested itself to railway engineers. So early as 1832 Giuseppe Medail laid before King Charles Albert a project of this nature which differs little from that which has been carried out; but it was not till 1857 that the parliament of Turin voted a sum of money for the purpose. In the same year the gigantic undertaking was begun. Although the tunnel is named from Mount Cenis, it does not actually pass through it, but through the Col de Fréjus about 15 miles to the s.w., where it was found possible to construct the tunnel at a lower level. The Mount Cenis pass is 2062·5 metres (6765 feet) above the level of the sea, whereas the elevation of the entrance to the tunnel on the side of Savoy is only 1159 metres (3801 feet), and that on the side of Piedmont 1294·6 metres (4246 feet). The total length of the tunnel is 12,849 metres (42,145 feet, or nearly 8 English miles). For the sake of the drainage the bottom of the tunnel has a culminating point about the middle, and falls southwards towards Bardonnèche a depth of 39 metres (128 feet), and northwards towards Modane a depth of 144·3 metres (473 feet). The breadth of the tunnel at the base is about 25 feet. at the widest part about 26 feet; its height at the Modane end is 24 feet 7 inches; at the other end about a foot higher. The determination of the exact direction and height of the tunnel occupied a full year, and the work of piercing the tunnel was carried out with so much precision that the borers who had begun from both ends at once met exactly. The tunnel is laid out for two lines of railway. The roof and walls are lined with masonry to the thickness of 2 feet 7 inches, and where the ground is not very firm it is underarched. While the operation of piercing the tunnel was going on a channel about 3 feet 3 inches in depth and nearly 4 feet broad served to convey away the water, and to contain the tubes intended to supply the labourers with air and gas. Before the beginning of the undertaking the geologists Beaumont and Sismonda made a report concerning the nature and thickness of the strata that would have to be bored through, and the calculations made in this report have been verified in a remarkable manner. The boring was at first carried on by hand labour, and one-eighth of the total length of the tunnel was finished in this way, but the rest was constructed by machines specially devised for the purpose by Grandis, Grattoni, and Sommeiller. The double difficulty of conveying power 3 or 4 miles into the mountain and of ventilating so long an underground passage was overcome by the use of atmospheric air compressed to a sixth of its bulk as the motive power to work the boring machines, and afterwards to supply the workmen with air. Each boring machine had eighteen borers, by which holes of about 3 feet in depth were wrought in the rock. For the blasting of every yard of the tunnel 97 borings on an average had to be made, and above 100 lbs. of gunpowder were employed. The total cost of the tunnel amounted to £2,600,000, which was borne partly by the French and Italian governments and partly by the Northern Railway Company of Italy. The first mine of the tunnel on the Italian side was exploded by Victor Emmanuel at the end of August, 1857; on Christmas day, 1870, the workmen met in the middle of the tunnel; and on the 17th of Sept., 1871, the tunnel was officially opened.

CENOBITE. See ANCHORITE and MONASTERY.

CENOTAPH, a monument erected in honour of a deceased person, but not containing his body, as is implied from the derivation (Gr. *kenos*, empty, and *taphos*, a tomb). They were often erected by the ancients, who believed that, when the body was not buried, the soul could not be admitted into the abodes of the blessed.

CENSER, a vessel in which incense is burned. Censers were employed by the Jewish priests for presenting incense to the Lord in the sanctuary. Censers or thuribles are used in some modern churches, especially in the Roman Catholic Church at mass, vespers, and on other occasions. They are suspended by chains, by which they are swung about in the hand to spread the incense in all directions.

CENSORS, two magistrates of ancient Rome, who kept a register of the number of the people and of their property, and regulated the finances. At the same time they watched over the morals of the citizens, and could stamp with degradation those of evil life or vile conduct. They were chosen for the first time in B.C. 443, and for the last time in B.C. 22, were appointed once every five years, but their term of office was limited to eighteen months.

CENSORSHIP OF BOOKS. See BOOKS (CENSORSHIP OF).

CENSUS, the ascertaining of the population of a country, town, or other district, together with any information concerning the population that may be required for administrative or other purposes. The census, strictly so called, is an essentially modern institution, but we read of censuses being taken in early times in China, Japan, Egypt, and among the Hebrews. Solon instituted a census in ancient Athens in order to ascertain the amount of property belonging to each Athenian citizen, and on the basis of the returns so obtained, the population was classified in four groups, paying different rates of taxes, and enjoying different privileges. Under the Romans, from whom we derive the word, the census was a register of Roman citizens and their property. It was established by Servius Tullius, the fifth of the kings, and as a result the whole people were divided into six property *classes*, and 193 (or 194) *centuriæ*. The people voted in the *Comitia Centuriata* according to their centuries, and the original arrangement was such as to put the main power in the hands of the wealthy. (See CENTURY, COMITIA.) In later times the taking of the census formed a part of the duties of the officials called *censors* (which see). The Roman census was taken every five years as a rule. During the Middle Ages some attempts were made to collect statistical information, but the census, as a modern institution, may be said to date from the early part of the eighteenth century. Sweden, which had introduced a regular registration of births, marriages, and deaths in 1686, was the first modern country to take a census of its population. This was done in 1749. At present a census of the Swedish population is taken every ten years, namely, in the closing year of each decade.

The first census of Great Britain was taken in 1801, and its results settled once for all many controversies which had long raged over the numbers of the population. The information required from the schedules comprised (1) the number of inhabitants in each parish, distinguishing males from females; (2) the number of inhabited houses, and of families inhabiting them; (3) the number of uninhabited houses; (4) a classification of the population according to occupation; and (5) the number of persons serving in the regular army and the militia. The inquiry under the fourth head proved a failure, and consequently in 1811 only the occupation of the head of a family was asked for. An age column appeared in the census paper of 1821 for the first time. The form of inquiry concerning occupations was altered in the schedules of 1831. The institution in 1836 of a uniform system of compulsory registration of births, deaths, and marriages in England, and the consequent creation of a regular staff of officials trained in statistical work, has proved of great benefit in securing accuracy and uniformity in the census returns. In 1841 the age of every person was ascertained for the first time, as well as the occupation of every person, distinguishing sex, and whether above or under twenty years of age. The column regarding place of birth also first appeared in 1841. In 1851 it was resolved to exhibit not merely the statistics, as before, of parishes, and more completely of parliamentary and municipal boroughs, but also of such other large towns in England and Scotland as appeared sufficiently important for separate mention, and of all the ecclesiastical districts. In addition also to the inquiry concerning the age and birthplace of the population, it was determined to ascertain the various relationships, the conjugal condition, and the number of blind, deaf, and dumb. But the most novel feature in this census was the attempt to supply the statistics of the ecclesiastical and educational condition of the country. It stated the amount of church accommodation at the command of each religious denomination, and a return was procured of those in attendance at the several churches on Sunday, 30th March. The most notable fact revealed by this census was the remarkable decrease in the population of Ireland, chiefly owing to the disastrous famine of 1845-47, and the vast amount of emigration produced by it. In 1861 it was proposed to ascertain the number belonging to each religious denomination in England and Wales, but the proposal had to be abandoned owing to the opposition of the Dissenters. The Gaelic-speaking population of Scotland was ascertained for the first time in 1881, and the Welsh-speaking population of Wales in 1891. The accuracy of the Scottish census has been greatly increased by the establishment of a permanent registration system in 1855. The first census of Ireland, taken in 1811, was a failure, and the second, taken in 1821, was not very reliable. That of 1831 was subsequently corrected in accordance with fresh data, and those of 1841 and 1851, taken chiefly by the constabulary force, were extremely accurate, and of the utmost statistical value. The objections which have hitherto prevented a religious census from being taken in Great Britain do not apply to Ireland, and consequently definite denominational returns are available for that country. The first attempt at a census of the whole British Empire was made in 1871, and in spite of the immense difficulty of the task it was effected with a very great degree of success. The census of 1901 was taken simultaneously in the three kingdoms and the islands in the British seas for midnight on March 31st. The schedules contained detailed directions regarding the filling up of the occupation column. The number of enumerators employed in the work in England and Wales alone was 38,200. The number of schedules collected in England and Wales, representing the number of families and separate occupiers, was 7,048,303. The population of Scotland exceded that of Ireland for the first time in 1901. The final returns of the English census of 1901 are to be issued by counties or groups of counties, each county being complete in itself and accompanied by a map furnished by the Ordnance Survey. In India and the British Colonies generally the census is taken decennially. New Zealand takes it quinquennially.

In 1787 a decennial census was made a part of the constitution of the United States, and the first was taken in 1790. The census of the States is more elaborate than that of any European country, chiefly because it offers the only constitutional means by which the federal government can obtain statistical information without encroaching on the rights of individual states. Intermediate censuses are taken by some of the states of the union, and a provision in the act of 1879 encourages this form of state enterprise. The first general census of France was taken in 1801, and since 1821 a census has been taken regularly every five years. The Prussian census dates from 1805. That of the German Empire is taken quinquennially. In other countries it is taken with more or less regularity.

CENT, CENTIME, &c., a name of a small coin in various countries, so called as being equal to a hundredth part of some other coin. In France the *centime* is the hundredth part of a franc and equal to about one-tenth of a penny. In the Netherlands the cent is the hundredth part of a gulden, and has a value of about one-fifth of a penny; in the United States and in Canada the hundredth part of a dollar, and equal to a halfpenny. Similar coins are the *centavo* of Chili (value about nine-twentieths of a penny), and the *centesimo* of various countries. Cents and corresponding coins are written as decimals of the unit of value.

CENT, a name given under the old Germanic constitution to a small portion of territory. Each province or district was subdivided into so many cents, and was placed under the special jurisdiction of an overseer or *centenarius*. The name corresponds with *hundred* as in English territorial division.

CENTAUREA, a genus of composite plants, containing many species, both annual and perennial. The knapweed (*C. nigra*) is a perennial plant, with a branched, hard, and angular stem, from one to two feet high, and hard, blackish-brown flower-heads, covered with dry, fringed scales, and having deep crimson florets in their centre. It is common on roadsides and in old pastures in Britain, and often proves a troublesome weed. *C. scabiosa*, greater knapweed, is also a common British roadside weed. Another species, *C. cyanus*, is the common corn-flower or blue-bottle, which with annuals like Sweet Sultan (*C. moschata*) and *C. Americana*, and perennials like *C. montana* and *C. candidissima*, is often cultivated in gardens.

CENTAURS, in Greek mythology, a fabulous race of people in Thessaly, on Mount Pelion. According to the fable they were the children of Centaurus, a son of Apollo, and the mares of Magnesia, or of Ixion and the cloud. (See IXION.) They are said to have been half horse and half man, and the fable is explained in this manner: The Centaurs first practised the art of mounting and managing horses. In the time of the Thessalian king Ixion a herd of wild bulls on Mount Pelion committed great devastations in the adjacent country. Ixion offered a great reward to whoever should destroy them, in consequence of which the Centaurs trained horses to bear them on their backs, and slew the bulls. Mythology relates the combats of the Centaurs with Hercules, Theseus, and Pirithous. The latter, at the head of the Lapithæ, another Thessalian nation, their hereditary enemies, entirely defeated the Centaurs, killed many, and drove them from Pelion. The Centaurs Nessus, Chiron, and others are famous in ancient fable. See CHIRON, DEJANIRA, HERCULES.

CENTAURY, the name of two plants used in medicine—common centaury (*Erythræa centaurium*), indigenous in Europe, growing abundantly everywhere; and American centaury (*Sabbatia angularis*), extensively distributed throughout the United States. Both are annual plants, and esteemed as tonics and febrifuges. *Chlora perfoliata* is sometimes called the Yellow Centaury; and the name centaury is occasionally applied to the genus *Centaurea*.

CENTERING. See BRIDGE.

CENTIARE, a French measure, the hundredth part of an *are* (which see), equivalent to about 1·19 square yard; thus, also, according to the French decimal system of measures and weights, we have *centigramme, centilitre, centimetre*, the hundredth part of a *gramme, litre, metre*. See DECIMAL SYSTEM.

CENTIGRADE. See THERMOMETER.

CENTIME. See CENT.

CENTIPEDE, an animal belonging to the group Chilopoda of the order Myriapoda. They are distinguished by having *antennæ* of fourteen joints and upwards, a mouth composed of two mandibles, a quadrifid lip, two *palpi*, or small feet, united at their base, and a second lip, formed by a second pair of dilated feet, joined at their origin, and terminated by a strong hook, having an opening beneath its point, through which a poisonous fluid is thrown out. The body is long, depressed, and membranous, each ring being covered by a coriaceous or cartilaginous plate, and having one pair of feet; the last usually points backwards, and is elongated in form of a tail. These animals are mostly nocturnal and carnivorous, and generally endeavour to escape from the light. They conceal themselves under the decayed bark of trees, the decayed timbers of buildings, among stones, lumber, and rubbish, whence they sally forth at night in search of prey. Centipedes are well known over a great part of the world, and several species occur in Britain, such as *Lithobius forficatus* and *L. variegatus*. These have a length of about an inch, the former being of a shining reddish-brown colour, with yellowish legs; the latter more brightly coloured, with banded legs. Their food consists of insects, worms, &c., which are easily killed by the poison of their bite. *Geophilus longicornis* and *G. subterraneus* are common British species of a different type, having the body very long and slender, and consisting of an enormous number of segments bearing a correspondingly great number of legs—fifty-five pairs in the case of *G. longicornis*. This species, like various others, is luminous in the dark. It is to the genus *Scolopendra* that the large and formidable centipedes of the tropics belong, some reaching a length of about a foot, or even more. Such large centipedes are familiar both in the East and the West Indies. *Scolopendra cingulata* of S. Europe has a length of three and a half inches. Centipedes are one of the greatest pests to be encountered in the West India Islands, and throughout the hot parts of the American continent. The materials of which the houses are constructed, and the rapid decay to which timber is subject in such climates, afford these noxious creatures excellent hiding-places, and they multiply with great rapidity. The utmost vigilance, even in the most cleanly houses, is necessary to prevent these creatures from finding their way into the beds, which they often do notwithstanding all the care that is taken to prevent them. They always attempt to escape when a light is brought into the room. They run with considerable swiftness, but are quite ready to stand on the defensive, and bite with severity. The bite is exceedingly painful at the moment, and is followed by a high degree of local inflammation, and a certain degree of fever. Where the animal is large, and the bite severe, life is seriously endangered, and not unfrequently lost, especially if the sufferer be of delicate and irritable habit of body. The immediate application of a cupping-glass or any convenient substitute over the wound removes the pain and danger at once. Spirits of hartshorn (volatile alkali, liquor ammoniæ) applied to the part, and doses of the same administered internally (30 or 40 drops) twice, thrice, or oftener in a day, will also lessen the pain and avert dangerous consequences. The mode of treatment first mentioned is the quickest and most certain. A popular remedy in all places where the centipede is common is the application to the wound of brandy or rum in which a centipede has been for some time preserved. These truly noxious creatures, 6 inches and more in length, are apt to be troublesome inmates of most of the houses in tropical regions. Yet persons become so accustomed to their presence, and regardless of danger from their bite, that no particular means are taken to lessen their numbers or to banish them effectually. The class Myriapoda, to which these animals belong, is now separated from the Insects, with which it was formerly united. (See Myriapoda.) When first hatched they have but six feet, or at least fewer than they afterwards acquire. The additional feet, as well as the rings to which they are attached, become developed as they advance in age, at the successive moultings which take place from time to time.

CENTLIVRE, Susanna, a dramatic writer, was born in Ireland about 1667. When very young she married a nephew of Sir Stephen Fox. Becoming a widow within a year she took for a second husband an officer of the army of the name of Carrol, who was killed in a duel the second year of their wedlock. This event in her singular career reduced her to considerable distress, and led her to attempt dramatic composition. Her first production was a tragedy entitled the Perjured Husband, which was performed in 1700. This was followed by several comedies, chiefly translations from the French, which exhibited the vivacity that distinguishes her literary character, and met with some temporary success. She also tried the stage as an actress on the provincial boards, and by that means attracted the attention of her third and last husband, Mr. Centlivre, whom she married in 1706. She still continued writing for the stage, and produced several more comedies. Some of these remain stock pieces, of which number are the Busy Body, the Wonder, and a Bold Stroke for a Wife. They are diverting from the variety of incident and the liveliness of the characters, but want the accompaniments of adequate language and forcible delineation. They partook of the license of the age. Mrs. Centlivre enjoyed the friendship of Steele, Farquhar, Rowe, and other wits of the day. Having, however, offended Pope, she obtained a place in the Dunciad, but is introduced by no means characteristically. She died in 1723.

CENTNER, a German weight, which may be regarded as the equivalent of the British cwt. It formerly varied in the different German states, but since the introduction of the metric system of weights and measures into the German Empire on the 1st of Jan. 1872, the value of the centner has been fixed at 50 kilograms, or 100 German lbs., = 110 lbs. avoir.

CENTO (*Latin*), originally a cloak made of patches; hence, as Lessing observes, the dress of Harlequin is called in Apuleius *mimi centuculus*. The term has been transferred to such poems as have been formed out of verses taken from other poems. It was a particular art to combine passages of different authors on different subjects in this manner so as to form a regular whole. Thus there were in early times Virgilian centos (*centones Virgiliani*), in which most of the verses were taken from Virgil; for instance, the epithalamium of Ausonius, and centos from the verses of Homer (*Homerocentones*).

CENTO, a town, Italy, 13 miles N. Bologna, on the E. bank of the canal of Cento, and near the river Reno. It is surrounded by a rampart and ditch, and contains several churches, convents, and a cathedral. The celebrated painter, G. F. Barbieri, commonly called Guercino, was born here about 1590. Pop. 5000.

CENTRAL AMERICA is the narrow tortuous strip of land which unites the continents of North and South America, extending from about lat. 7° to 18° N.; but as different limits are assigned to it by various authorities, these cannot be said to be exactly determined. The limits most generally assigned to it include the five republican states of Guatimala, Honduras, San Salvador, Nicaragua, and Costa Rica (which see), with British Honduras and the Mosquito Coast. It thus has Mexico on the N.W., Colombia or New Granada on the S.E., and the Pacific Ocean and Caribbean Sea on either side. Its entire length may be about 800 miles, with a breadth varying from between 20 and 30 to 350 miles. The area is estimated at about 200,000 square miles; the pop. at 3,200,000. It is traversed throughout its whole length by a chain of mountains which connects the Andes of South America with the mountain ranges of Mexico and the Rocky Mountains of the United States. This chain is divided into three groups. the Costa Rica group, the Honduras and Nicaragua group, and the group of Guatimala. The Costa Rica group traverses the Isthmus of Panama. Some parts of this range, towards the S., attain an elevation of 9000 feet; and the volcano of Irasu rises to 11,478 feet; but there are others said to be of still greater height. The more general elevations, however, are from 3000 to 5000 feet. The Honduras and Nicaragua group is separated from the former by the Lake of Nicaragua and the river San Juan. On the N. side of the lake the border of the plateau forming its W. limit rises suddenly to a height of 8200 feet. The Guatimala group is remarkable for containing, with exception of the island of Java, the greatest number of active volcanoes known to exist within similar limits on the surface of the globe. The highest in Central America is Agua, which is said to attain an elevation of 15,000 feet. The volcano of Agua has obtained its name from its emitting torrents of water and stones instead of fire. The mountains of Central America do not generally attain an elevation equal to those of the two adjoining continents, with exception of the volcanoes. The coast lands are generally narrow, and in some places the mountains and high lands come close down to the water's edge. The rivers of this territory are small, and have necessarily, from the narrowness of the land, short courses, the longest not exceeding from 200 to 300 miles, while many of them are not more than 50. Of the latter are those that fall into the Pacific; of the former those that join the Atlantic, both having their sources in the mountainous regions of the country, the one flowing N.E., the other S.W. The largest river is the Usumasinta, which falls into the Gulf of Campeachy. There are about thirty other rivers worth noting, many of which are navigable for several miles into the interior. The principal lake is that of Nicaragua, which is upwards of 100 miles in length, and about 50 miles in breadth. The other considerable lakes are those of Managua or Leon, Golfo Dolce, Golfete, Peten, Atitlan, Amatitlan, Guija, and Cojutepeque.

The climate is exceedingly various owing to the inequality of the surface. The low grounds on the coast of the Caribbean Sea are exposed to violent tropical heats, and are generally unhealthy; but on the table-lands any temperature, according to altitude, may be obtained all the year round, with a salubrious climate. The dry season lasts from about October to May; the rest of the year is called the wet season, although the rain falls during the night only, the days being fair and cloudless, and the air pure and refreshing. The vegetable productions are as various as the climate. On the higher parts of the table-land the grains, fruits, and vegetables of Europe are raised. The lower and warmer districts produce in great abundance Indian-corn, sugar-cane, bananas, and all sorts of tropical fruits, with sweet-potatoes, indigo, cacao, cochineal, tobacco, and cotton. The forests, which are very extensive, produce mahogany, pimento, sarsaparilla, vanilla, rubber, and the balsam commonly called Peruvian balsam, together with various other drugs, gums, and valuable woods, including logwood, mahogany, and lignum-vitæ. The forests contain about a hundred different kinds of trees, which grow most luxuriantly in the moist, hot, and unhealthy regions. Various creepers and parasitic plants, and among them beautiful orchids, adorn the forests. The zoology of Central America differs little from that of other parts of tropical America. Among the mammals are the puma, jaguar, and various other carnivores, monkeys, sloths, tapirs, armadillos, peccaries, &c. Amongst the birds, the most remarkable are humming-birds; parrots; toucans; the resplendent trogon, whose feathers are of a bright emerald green and scarlet; the great macaw; and several others of the most splendid plumage. Serpents are numerous, some of them dangerous, especially on the thickly-wooded coast of the Pacific. Alligators infest some of the streams and lakes, and often attack domestic animals. The rivers, lakes, and seas abound with fish. Of the geology little is known with accuracy. Granite, gneiss, and mica-slate form the substrata of the country; but the abundance of igneous rocks bears witness to strong volcanic action, both in ancient and in modern times. Gold, silver, iron, lead, and mercury are found; but none are worked to any great extent. Jasper and marble are worked in Honduras; and sulphur is collected near the volcano of Quezaltenango. There are also many salt springs; and salt is procured in large quantities on the shores of the Pacific.

The population consists of three main classes—whites; mestizoes, or the offspring of whites and Indians; and pure-blooded Indians or aboriginal natives. The proportions of this population have been estimated at one-twelfth whites, four-twelfths mixed races, and seven-twelfths Indians. Morality is at a low ebb among all classes, especially the whites; while ignorance, vice, and superstition prevail to an extent unsurpassed in any other part of the world. The Roman Catholic religion is professed by all. The chief occupation of the people is agriculture; manufactures proper do not exist. The chief export is coffee; others include cocoa, fruits, hides, indigo, sugar. The imports are mostly manufactured goods. Trade is much hampered by the absence of good roads, railways, or navigable rivers. The idea of constructing a ship canal between the Atlantic and Pacific Oceans, and thereby avoiding the circuitous navigation round Cape Horn, is so obvious that one need not wonder that it has been entertained for upwards of three centuries. Nothing was really done, however, till the Panamá Canal was undertaken. More recently another scheme has been begun—the Nicaragua Canal—in which advantage will be taken of the river San Juan and the Lake of Nicaragua.

The east coast of Central America was visited by Columbus in his fourth voyage in 1502. At this time the dominant race in the country was the Quiches, who had made remarkable advances in civilization, had built large cities, and possessed written chronicles narrating their past history for a considerable period. Ruins of these cities may still be seen, but there are other ruins of cities which are believed to have been the work of an earlier race. The Quiches appear to have come from Mexico to Central America. At the time of the conquest of Mexico by Cortez, Utatlan was the principal seat or capital of the Quiches. They were subdued by Pedro de Alvarado, acting under a commission from Cortez. He set out from Mexico on this expedition in 1523, with an army of 300 Spaniards, and with a large body of auxiliary Indians from Mexico, Cholula, and Tlascala. Many desperate and sanguinary battles were fought before the invaders could break the spirit of the Quiches and effect the subjugation of the country. Some of these took place near the river Zamala, which thus acquired, in the vicinity of the fields of carnage, the name of *Xiquigel*, or *River of Blood.* After the death of their king, Tecum Umam, who fell in battle at the head of his subjects, the Quiches had recourse to a stratagem as bold as it was grand in conception. Their chief city, Utatlan, abounded in palaces and other sumptuous edifices, being hardly surpassed in splendour by Mexico and Cuzco. It was encompassed by a lofty wall, and was capable of being entered only at two points; on one side by a causeway, and on the other by a flight of steps. Within, the buildings stood high and compact. In the hope of exterminating their enemies the Quiches invited the Spaniards into their capital, pretending a willingness to submit. After their entrance the Quiches set fire to the city, and if the Indians of another tribe had not been false to their countrymen and betrayed the secret, Alvarado and his followers would have perished. Having escaped this danger, the Spaniards pursued their victorious course until all opposition was crushed. In 1524 they laid the foundations of the city of Guatimala. After the subjugation of the Quiches, the remaining tribes were subdued with comparative facility, and the dominion of the conquerors was permanently established. The government of this country, as constituted by Spain, was subject to the Mexican; but the dependence was far from being close. It was denominated the *Kingdom of Guatimala*, and governed by a captain-general. Its inhabitants remained true to Spain till 1821, when they declared their independence; and although for a time a large part of the country was joined to Mexico under the rule of Iturbide, yet, on his downfall, they recurred to their original purpose of forming a separate republic. A constituent congress was convoked, which on 1st July, 1823, published a decree declaring the five states already mentioned a republic under the title of the United States of Central America. Civil dissensions were not long in making themselves felt, however, and in 1839 the union between the five states was formally dissolved. Guatimala, Honduras, Nicaragua, and San Salvador again formed a union in 1842, but this lasted only till 1845. Since that time several attempts (one in 1898) have been made to unite the five states, but without permanent success.

Central America contains antiquities of a very interesting nature, which indicate that the aboriginal inhabitants of the country had even attained a very respectable proficiency in the knowledge of the arts of life. Ruins of large cities exist in various places, with remains of temples, altars, and ornamental stones, statues of deities, and other works of sculpture. See AMERICAN ANTIQUITIES.

CENTRAL FORCES. When a body is acted on by a force always directed to a fixed point, the force is called a *central force*, and the fixed point is called the *centre of force*. The force is said to be attractive or repulsive according as its action on the body tends towards or from the centre. The motion of a body under the action of a central force is one of the most important problems of theoretical dynamics, because the planetary motions take place under the action of forces of this kind; and the laws of motion under central forces determine the relative motions of planetary systems. Thus, although the moon is influenced by the attraction of the sun, and by the attractions of other planets besides the earth, still an important approximation to the relative motion of the moon with respect to the earth may be got by supposing the moon to move under the action of a force varying inversely as the square of the distance, and directed towards the earth's centre, supposed fixed. The perturbations of the planets, and the effect of the attraction of the sun on the moon, as also the fact that the earth is not fixed, but moving round the sun, are subsequently taken into account in considering the motion of the moon relatively to the sun considered as a fixed point.

Newton investigated the motion of bodies under the action of central forces. We shall here only mention some of the laws of motion for an *attractive* force, which is the most important case. A body starting from rest under the action of an attractive central force will of course be drawn in to the centre of force with a gradually increasing velocity, but a body projected in a direction which does not pass through the centre of force will not be drawn in to the centre of force, but will describe a curve round it. A body acted on by a central force describes a curve round the centre such that the radius vector—that is, the straight line which joins the body with the centre of force—traces out equal areas in equal times. If the force be attractive, and if it varies inversely as the square of the distance of the body from the centre of force, the curve that the body describes will be a hyperbola, a parabola, or an ellipse, of which the centre of force occupies a focus. The latter is the case of planetary motion. (See KEPLER'S LAWS, GRAVITATION, &c.) A body moving under the influence of a force directly proportional to the distance describes an ellipse, at the centre of which is placed the centre of force.

CENTRAL PROVINCES, an extensive British territory in India, presidency of Bengal, occupying a position about the middle of the peninsula. The area of the tract, so called, is somewhat smaller than that of the United Kingdom. These provinces became a separate administration in 1861, and are under the authority of a chief commissioner. Their total area is computed to be 113,042 square miles, of which 84,208 square miles are British territory, and 28,834 the territory of native protected states, fifteen in number. The extreme length of the province from E. to W. is 600 miles, and the extreme breadth from N. to S. 500 miles. By the census of February, 1891, the population, excluding the native states, was returned at 10,761,630 persons, or 127 to the square mile. The cultivated area is small, little more than one-fourth of the British territory being turned to account, and more than one-half of the remainder being uncultivable. The province is traversed by 3000 miles of made roads and 500 miles of railroad. For administrative purposes the province is divided into four commissionerships, Jabalpur (Jubbulpore), Nagpur, Narbada (Nerbudda), and Chhattisgarh (Chutteesgurh), and these contain nineteen districts, averaging 4430 miles in extent. Narbada is admirably adapted for the cultivation of the sugar-cane, of cotton, and of wheat, and it contains coal and iron. The province of Nagpur has extensive cotton fields extending along the Wardha (Wurda), which forms its south-western boundary, and it contains the celebrated cotton market Hinganghat; the valley of the Wainganga, further east, grows maize, wheat, and rice; and still further east the plateau of Chhattisgarh, although not as yet very extensively cultivated, promises to become the granary of the Central Provinces. The chief imports are salt, sugar, English piece goods, cattle, cocoa-nuts, and spices; the chief exports cotton, country cloth, grain, oil seeds, silk cocoons, ghi and oil, lac and hides. Education, especially female education, is still in a very backward state. The principal towns are Nagpur, Jabalpur, Sagar, Chanda, and Mandla. The annual revenue of the Central Provinces amounts to fully £1,000,000.

CENTRE OF GRAVITY, a term often misapplied, where the term *centre of inertia* ought to be used. *Centre of gravity* is, properly speaking, the point of a rigid body through which the resultant of the weights of the various particles of the body passes. Only a limited number of bodies, however, possess such a point, and these are called *centrobaric* bodies. In the case of small bodies the force of gravity of such a mass as the earth acts in lines approximately parallel, and equal masses are equally influenced by it. Hence, considering the forces of gravity on small equal masses of such a body as though they formed a system of equal parallel forces, a point, the centre of these parallel forces, may be found which coincides with the centre of inertia for the body, and this is often, though wrongly, called the centre of gravity. Still farther, a central point found as above for a system of bodies not rigidly connected is very often called the centre of gravity of the system. This, however, is absolutely wrong, for no centrobaric body can consist of parts isolated from one another, each in space external to all.

CENTRE OF INERTIA, or CENTRE OF MASS The centre of inertia of a system of *equal* material points, that is, points of *equal* mass (whether connected with one another or not), is the point whose distance from any plane whatever is equal to their average distance from that plane. In order actually to determine the point for any system, it is only necessary to find its distance from three planes at right angles to each other, according to the ordinary system of co-ordinate geometry (which see); for it is readily proved that any system of material particles can have but one centre of inertia. The definition above may be applied to any system whatever of equal or unequal masses in the following way:—If at any point there be a mass equal to *three*, it is considered as three equal masses, each equal to unity placed at that point. Another point, at which a mass five is placed, is reckoned as five masses, each equal to unity, placed at the same distance from the plane of reckoning. Hence we have the following rule for finding the distance of the centre of inertia of any number of masses from any given plane:—Multiply the distance of any point from the plane of reference by the mass placed at that point; add the products thus got, and divide by the sum of the masses. This rule is easily shown to be equivalent to the following, which is very important, and at the same time very different in form from that just given:—Let there be any number of masses arranged in any way, and let it be required to find the centre of inertia of them. Join the first two masses by a straight line, and cut this line inversely as the masses, that is to say, in proportion to the masses, and so that the larger mass shall have the smaller segment of the line nearest to it. Join the point thus found with the third mass, and cut this new line inversely as the sum of the first and second masses to the third. The newly-found point is joined with the fourth mass, and the line is cut inversely as the sum of the first three masses to the fourth; and so on till all the masses are used up. The last found point is the centre of inertia of the system.

The explanations above have assumed that the masses dealt with are commensurable. When that is not the case, or when it is required to find the centre of inertia of a continuous body—for example, of a triangular or semicircular plate—approximations true to any degree of accuracy required may be obtained by dividing the body or bodies in question into excessively small parts, and applying the rules given above. This is done every day in the drawing-offices of practical engineers and ship-builders. In many cases also the methods of infinitesimals are employed, and results exactly true are obtained by means of the integral calculus. Some of the results obtained by these and by ordinary geometrical processes are given below.

An important use of the centre of inertia is that in all cases in which a body has a *centre of gravity*, that is, a point about which the forces of gravity on its parts balance, that point is identical with the centre of inertia: and in cases when there is not a real centre of gravity, still the forces of gravity on the various parts of the body or system approximately balance about the centre of inertia of the body or system. This has led to the inconvenient confusion of using the terms centre of inertia and centre of gravity synonymously.

The following are the positions of the centres of inertia of some of the most important solid figures:—

1. Of a *material straight line of uniform density* the centre of inertia is at its middle point. This is the same as the case of a *uniform straight rod or cylinder of circular or elliptic section* terminated by parallel planes. The centre of inertia is here at the middle point of the axis: and the centre of inertia of a *uniform straight circular tube*, which may be considered as a cylinder out of which a co-axial cylinder of smaller radius has been cut, is also at the middle point of the axis of the tube.

2. The centre of inertia of a *circular* or *elliptic plate* is at the centre of the circle or ellipse.

3. Of a *sphere* or *spheroid*, at centre of the figure.

4. Of a thin *parallelogram* or *parallelopiped*, at the point of intersection of the diagonals.

5. Of a *triangular plate*, at the point where the three lines drawn each from an angle to the middle point of the opposite side cut each other. Thus it lies on one of these lines two-thirds of its length from the angular point.

6. Of a *semicircular plate*, in the line drawn perpendicular to the base from the middle point of it, and at a distance from that point found by dividing two-thirds of the diameter by the number 3·14159, which is the ratio of the circumference of a circle to the diameter.

7. Of a *semiellipse*, the same as a semicircle of same height.

8. Of *a parabola* cut off by any chord: let a tangent to the parabola parallel to the chord be drawn, and let a line be drawn parallel to the axis through the point where the tangent touches the curve, the centre of inertia is situated on this chord three-fifths of its length from the tangent point. Thus in the case of a parabola standing on a chord at right angles to the axis, the height of the centre of inertia will be two-fifths of the height of the curve.

9. Of a *sector of a circle*, at a distance from the centre found by multiplying two-thirds of the radius by the chord and dividing by the arc.

10. Of the *surface of a hemisphere*, at the middle point of its height.

11. Of a *solid hemisphere*, three-eighths of its height.

12. Of a *pyramid or cone:* let the apex of the pyramid or cone be joined with the centre of inertia of the area of the base; the centre of inertia of the solid is on this line one-fourth of its length from the base.

The following will give some indications as to the importance of considering the centre of inertia of bodies and systems in theoretical mechanics. When a body is suspended from a point it behaves sensibly as if its whole weight were concentrated at its centre of inertia, as has been mentioned above and under article Centre of Gravity. Hence we may consider the body as acted on by two forces, the weight of the body acting vertically downwards through this point, and the reaction of the pressure at the point of support. When these act in one straight line there is equilibrium, that is, the body remains at rest, provided the point of support is sufficiently strong to bear the weight of the body. When that is not the case there will ensue, if there are no other forces acting on the body, such a motion as will bring the body into a position in which these two forces are in one vertical line, and, generally, in which the centre of inertia is below the point of support. Again, when a body rests on a smooth horizontal plane similar considerations apply. The questions regarding stable, unstable, and neutral equilibrium would enter here, but that we cannot examine them in this article. The reader may consult Mechanics (sect. *Statics*), Hydrostatics (sect. *Metacentre*), &c.

The very important 'properties of Pappus' are also intimately connected with the centre of inertia, but these also must be dealt with under a separate head. See Pappus (Properties of).

CENTRE OF OSCILLATION. The difference between a 'simple pendulum,' a theoretical conception, and a 'compound pendulum' is explained under Pendulum. The centre of oscillation of a pendulum is a point such, that if all the mass of the pendulum were concentrated at it, and if it were rigidly connected with the centre of suspension of the pendulum, the vibrations would be performed in the same time as before. It is on the distance of the centre of oscillation from the centre of suspension, therefore, that the time of vibration depends.

The position of the centre of oscillation may in some cases be determined by calculation. In practical cases, however, it is determined by trial by means of the following remarkable property. *The centres of oscillation and suspension are convertible, and the time of oscillation of the pendulum about each is the same.* Suppose a pendulum vibrating about an axis through a point A, and let B be the centre of oscillation: then, if it be caused to oscillate about B, A will be the centre of oscillation. This principle is employed practically in the following way in cases where it is desirable to know exactly the 'length of the equivalent simple pendulum;' for example, when the pendulum is used for determining the force of gravity. The pendulum is furnished with two knife-edges, and with two weights attached to the pendulum rod: one of the weights is adjustable, and is moved up and down till the pendulum vibrates in equal times on each of the knife-edges. The distance between the knife-edges is evidently the length of the equivalent simple pendulum.

CENTRE OF PRESSURE OF LIQUIDS. See Hydrostatics.

CENTREVILLE, a village, United States, Virginia, Fairfax county, 27 miles w. Washington, contains one church and a few stores, but is memorable for the series of battles fought in its vicinity on the last days of August, 1862, in which the Federal army, under General Pope, suffered heavy loss and a severe repulse. Pop. 1721.

CENTRIFUGAL FORCE. It is necessary, in order to make a body move uniformly in a circle, to apply to it at every point of its course a force directed towards the centre of the circle. The reaction of the body against this force is called centrifugal force. Thus, when a stone is attached to a string, and whirled round, it is the constant pull of the hand on the string that keeps the stone moving in the curve: if the string were cut suddenly the stone would fly off at a tangent to the circle: the pull of the stone on the string, which is the force felt by the hand, is the centrifugal force. The centrifugal force ascribed to bodies moving in curvilinear paths is simply the inertia defined in Newton's first law of motion, which says that every body continues in a state of rest or of uniform motion in a straight line except in so far as it is compelled by external forces to change that state.

The measure of the force in absolute or kinetic units (which see) is the mass of the body multiplied by the square of the velocity, and divided by the radius of the circle; and the number thus found is reduced to ordinary gravitation measure by dividing by 32, the number which expresses the force of gravity. For example, a stone is attached to a string 3 feet long, and whirled round so that its velocity is 12 feet per second, the mass of the stone being 2 lbs., let it be required to calculate the tension in the string. According to the rule given, centrifugal force $=\frac{2\times(12)^2}{32\times3}=3$; the tension of the string is equal to that produced by a weight of 3 lbs.

The term centrifugal force is employed in every case of a body describing a curve whether the curve be a circle or not, and whether the velocity be uniform or not. Whenever a body moves in any but a rectilinear path force must be applied, acting towards the concave side of the path, and the body itself exerts an outward pressure which is called centrifugal force.

In such a case as this centrifugal force at any point is measured by the rule just given for uniform circular motion, substituting for the uniform velocity above considered the velocity at the point, and for the radius of the circle the radius of curvature at the point in question. See CIRCLE OF CURVATURE.

CENTRIFUGAL MACHINE. See SUPP.

CENTRIPETAL FORCE, that force which draws a body towards a centre, and thereby acts as a counterpoise to centrifugal force in circular motion. Centripetal force is simply a name for a central force, that is a force tending to cause a moving body to proceed to a centre, when considered under a special aspect. See CENTRIFUGAL FORCE.

CENTURIES OF MAGDEBURG, the first comprehensive work of the Protestants on the history of the Christian Church, so called because it was divided into centuries, each volume containing a hundred years, and was first written at Magdeburg. Matthias Flacius formed the plan of it in 1552, in order to prove the agreement of the Lutheran doctrine with that of the primitive Christians, and the difference between the latter and that of the Roman Catholics.

CENTURION, in the ancient Roman army the commander of a century, or body of 100 men. The rank of a centurion corresponded pretty much to that of a captain in modern armies. Each legion had sixty centurions. See CENTURY, LEGION.

CENTURY (Latin *centuria*, from *centum*, a hundred), a division of 100 men, sixty of which formed a legion. This kind of division was very common with the Romans, and the name was used in general to denote a particular body, although this might not contain exactly 100 men. Thus centuries in the army were the companies into which the Roman legions were divided, each being commanded by a centurion. (See preceding article.) This name was also given to the divisions of the six classes of the people, introduced by Servius Tullius. According to Livy the first class contained eighty-two, to which were added the eighteen centuries of the knights; the three following classes had each twenty centuries, the fifth thirty-four, and the sixth only one century. There were thus 194 centuries in all. Dionysius arranges the centuries somewhat differently, giving a total of 193. The people voted in the *comitia centuriata* by centuries. See CENSUS.

CEOS, an island, Greece. See ZEA.

CEPHALONIA, or KEPHALLENIA, the largest of the Ionian Islands, lying W. of the entrance of the Gulf of Corinth, about 32 miles in length, and 12 in breadth; area 256 square miles; capital, Argostoli. With the adjacent island of Ithaca it forms a nomos or province of the kingdom of Greece; population in 1896, 83,363, of which over 28,000 belonged to Cephalonia. The surface is rugged and mountainous, rising in the pine-clad Ainos or Black Mountain to the height of 5380 feet; the coast-line is very irregular, and deeply marked with indentations, the principal of which are the bays of Samos, Zola, and Argostoli. There is a scarcity of water, there being no permanent streams. The climate is warm and delightful, the landscape is adorned with flowers during the whole year. A great part of the soil is devoted to the production of currants, wine, olive-oil, citrons, melons, pomegranates, &c. The currants are preferred to those of any other of the Grecian islands, and even to those of the Morea. The chief exports are currants and oil; wine, cheese, &c., are also exported. The principal imports are grain, fish, textile goods, and timber. The manufactures of the island are inconsiderable, consisting of some cottons, carpets of mixed wool and goats'-hair, with some potteries and distilleries of liqueurs. The island is subject to frequent earthquakes. One of the most destructive was that of the year 1867. The greater part of the population are of the Greek Church; the others belong to the Church of Rome, and have a Roman Catholic bishop and several convents of Franciscans. Cephalonia is called Same or Samos by Homer. Its later name, first occurring in Herodotus, is said to be derived from Cephalos, a mythical hero who conquered it from the early Taphian inhabitants, and even in Homer the people of the island are known as Cephallenes. Two hundred citizens of Pale fought in the battle of Platæa, but the rest of the island took no part in the Persian war. The island adhered to Athens during the Peloponnesian war. In 189 B.C. it came under the Roman dominion, and so remained, apparently with considerable autonomy, till after the division of the empire, when it became subject to the Byzantines. In the twelfth century it was taken by the Normans, and afterwards fell successively into the hands of the Venetians and Turks, and then again into the hands of the Venetians, who retained possession of it until 1797, when the French seized it. From 1815 it belonged to the Republic of the United Ionian Islands, and in 1864 was united with the other islands to the Kingdom of Greece. In the time of Thucydides the island had four cities: Same, Proni, Cranii, and Pale. Strabo only knew of two. At present Lixuri is the town of next importance to Argostoli, and stands on the same inlet.

CEPHALOPODA (Gr. *kephalē*, head; *pous*, foot), the highest class of the Mollusca, having the mouth surrounded by a circlet of arms with which the animal can creep on the ground as well as seize its prey. Aristotle speaks of them as *malakia* or soft-bodied animals, but the group now includes the nautilus with its solid external shell, the ammonites with their massive shells, as well as the soft-bodied cuttle-fishes, with an internal shell (see Plate at art. MOLLUSCA). The simplest way of stating the essential difference between the cephalopods and the ordinary gasteropods is to take the familiar garden slug, and suppose the flat surface or 'foot' on which the animal creeps, reduced to a broad disc underneath the head, leaving posterior a long sac in which are lodged the internal organs, liver and the like. If this disc had its edges carried over the back of the head just behind the mouth, till the halves of opposite sides met, we should have a collar surrounding the neck, so that the mouth is at the bottom of the inclosed space. If the edges of this collar were projected into finger-like processes, the cuttle-fish arms would appear. On the dorsal surface, just behind the arms, is a funnel, the wider end of which enters a cavity closed in by the general integument, but open by a transverse fissure behind the funnel. In this chamber the gills are lodged; and the respiratory movements help progression in the following manner. The water enters the sac by the transverse slit, and when the chamber is full the muscles contract to expel the water; it therefore enters the wide end of the funnel, and presses its soft walls outwards, so that they are jammed against the sides of the cavity, and the water can escape only by the narrow end of this funnel. This forcible expulsion of the water propels the animal in the opposite direction. The cuttle-fish usually swim horizontally, so that the funnel is on the upper surface, but they can reverse themselves and creep along the ground by means of the arms. The Cephalopoda are divided into groups, the one including the nautilus of modern seas, the ammonite and Orthoceras of former periods; the other including the living cuttle-fishes or squids, and the fossil belemnites, &c. The nautilus has two pairs of gills in the branchial chamber, the cuttle-fishes one, the former constituting the order Tetrabranchiata, the latter the Dibranchiata. In the former order the shells, whether curved as in the ammonites, or straight as in the Orthoceras, consist of a series of chambers, each wider than that which preceded it, so that there is a gradual steady increase in the diameter of the shell. Each chamber is connected with that which follows by a tube or 'siphuncle,' partly membranous, partly shelly, so that the whole series communicates with the last or most recently formed chamber, in which the animal is lodged. In the nautilus the shell is curved as is a disc of tape, so that the spiral is flat, and the last turn of the shell covers that which preceded: whereas in the snail and whelk the spire is elevated, and each whorl only partly covers the preceding. The Cephalopoda possess a highly developed nervous system, the central organs of which are lodged in a cartilaginous case, which gives attachment to the muscles of the arms. In the walls of this skull-like case the eyes and auditory sacs are lodged, but there is no real resemblance to the skull of a vertebrated animal; it is simply an analogous structure whose size is increased by the muscular actions of which it is the starting-point, just as the bones of mammals are enlarged in proportion to the strength of the muscles they support. All the gasteropod molluscs possess a tongue which is set with transverse rows of minute and very hard denticles, so that the animal by the to and fro movement of the organ rasps off the surfaces against which it is applied. In addition to this tongue the Cephalopoda possess a pair of jaws which in form and colour resemble the beak of a parrot. As carnivorous animals they are, therefore, very effectively armed. But their power is still further increased by a provision for clinging to their prey. The arms of the cuttle-fishes are provided with suckers, circular rings of cartilage inclosing a cup-like depression, at the bottom of which is a soft cushion. When the rim of this cup is applied evenly the animal can raise the cushion so as to enlarge the cavity of the cup, and thereby diminish the pressure of the air; and can instantaneously let go its hold by allowing the cushion to fall. The ring which supports the piston in the cup may be denticulated, and even a sharp hook may project, so that the dry and the wet cupping of the surgeon are represented in this group. Thus, as many of the cuttle-fishes attain to very considerable size, they are naturally objects of dread to the natives of those tropical islands near which they abound at certain seasons. See the article KRAKEN for an account of some remarkably large specimens seen. An animal with arms 6 feet in length is formidable enough; and one even a third of that size might well prove fatal to a man whose limbs it might entangle. All the cuttle-fishes have eight arms placed in a single circlet; but one group has an additional two tentacles which arise within the outer row, and are distinguished from the rest by having the often curiously armed suckers restricted to a small space near the extremity. Those which thus have ten limbs are the *Decapoda;* those which want the additional tentacles are the *Octopoda.* These names designate the two sections into which the Dibranchiata are divided. The latter include the common poulpe; the former are a more numerous assemblage, among which the squids, calamaries, and sepia are familiar. The last gives its name to a pigment which, though now prepared like Indian-ink from lampblack or charcoal, was at first obtained from the ink of cuttle-fishes in the eastern seas. This bag opens by a duct in the gill-chamber, so that when the animal is alarmed the same effort which expels the water from that chamber diffuses the black fluid through the water, and covers the animal's retreat. Beneath the skin, on the opposite side of the body from the funnel, there is a cavity in which is lodged the shell, which is either a thin horny plate as in the 'pen' of the calamary, or a thick calcareous mass, as in the 'bone' of sepia, or a more complicated structure as in the belemnites, the characteristic fossils of the secondary formations, in which the pen terminates in a chambered cone, with an external 'guard.' The argonaut or paper sailor, the nautilus of Aristotle, has no shell, the delicate spiral calcareous structure found in collections being in reality a secretion from the surface of the expanded extremities of two arms which are curved backwards over the hinder end of the body. It is not in contact with the body, but affords a space in which the eggs are lodged, for it is peculiar to the females, the smaller males having all the arms alike. The fable of the argonaut holding up the expanded arms as sails is now exploded, though these are in reality used as oars. Of the tetrabranchiate division only one genus, the nautilus, survives, the great majority having become extinct in the tertiary period. The organization of the nautilus shows inferiority to that of the dibranchiates, the number of the arms being very much greater, amounting to thirty-six, and the branchiæ more numerous. The whorls of the shell are in close contact in *Nautilus,* but in *Lituites,* a Silurian genus, they are separate. The apparently trivial characters of the surface of the shell are of importance in paleontology, thus the shells with transverse ridges are mostly Cretaceous, those with

longitudinal striæ are only found in the Oolites, while those with smooth surfaces range from the Permian strata to the present day. The ammonites have an operculum or lid to the last whorl, and the siphuncle is external. The sutures or lines which indicate on the outside the position of the transverse partitions are angulated, lobed, or crenulated, the varieties of pattern being of use in determining the age of the strata in which they occur. This character, together with that of the keel or middle line of the whorls, is the basis of the classification of some of the secondary deposits. In the Orthoceratites, which range from the Silurian to the Carboniferous period, the siphuncle is beaded, that is to say, it presents a globular expansion in the middle of each chamber. The Orthoceras is straight, the Cyrtoceras curved, the whorls not being in contact.

CEPHALUS, the son of Creusa; according to some the son of Deion, king of Phocis, and of Diomede. He was the husband of Procris, or Procene. Shortly after his marriage Eōs (Aurora) carried off the beautiful youth while he was hunting on Mount Hymettus. He refused the love of the goddess, who induced him to put the virtue of his wife to a trial which it could not withstand. Procris, in return, tempted him likewise, and he yielded also. Learning their mutual weakness, they became reconciled. But Procris subsequently became jealous of her husband, and concealed herself in a wood to watch him. He mistook her among the leaves for a wild animal, and killed her with a javelin.

CERACCHI, Giuseppe, an eminent statuary, born on the island of Corsica July 4, 1751, or, according to others, about 1760. In 1798 he took part in establishing the republic at Rome, of which he was among the warmest partisans. On the re-establishment of the Papal authority he was obliged to leave Rome, and went to Paris, where he was employed in making a bust of the First Consul. Nevertheless, he joined the young French artists whom he had known at Rome, and whose ardent republican opinions coincided with his own, in a conspiracy against Bonaparte, in whom he saw only the oppressor of his country. On the 9th of November, 1800, he was arrested at the opera, with Arena, Damerville, and Topino Lebrun. Before the tribunal he answered only in monosyllables to the questions put to him. He was sentenced to death, together with his accomplices, and ascended the scaffold January 29, 1801, with great firmness. The death of this disciple, and almost rival, of Canova, was a great loss to sculpture.

CERAM, or Ceiram, called by the natives Zeram or Sirang, the second largest island of the Moluccas, in the Indian Archipelago, having Amboyna on the s.w., Booroo on the w., and Papua on the e.; area about 7000 square miles; pop. estimated at 195,000. Its interior is very imperfectly known, but it is understood to be traversed by mountain ranges from 6000 to 8000 feet high, and culminating in Noosaheli, which is 9250 feet. The vegetation is luxuriant and gigantic, and some trees of the sago-palm, which grows 100 feet high, yield 12 cwts. of starch. The inhabitants of the coast are of Malay origin, and have extensive fisheries, with the produce of which they sail in large prahus to the Sunda Islands and Singapore. The interior is peopled by Alfoories, long known for their barbarous custom of using human skulls for public and private ornament, and the still more barbarous atrocity of committing murder in order to procure them. They are said to have become more civilized, and many of their rajahs have adopted the European dress and manners. They are divided into various independent tribes, and live on pisang, sago, rice, &c. Christianity has been introduced into several villages on the south coast, but not with any great success, though it is said that in some of the villages a considerable number of those professing Christianity can now read and write. The island belongs to the Dutch, who have established several stations on it under the charge of an official residing at Wahai on the north coast.

CERAMIACEÆ, the fourth order, according to Endlicher and Lindley, of the Algæ or aquatic flowerless plants. The plants of this order are sea-weeds, of a rose or purplish, and sometimes, though rarely, olive or violet colour. The cells are either long and tubular, round and short, or polygonal. Many of the plants of this order contain a large amount of gelatinous matter, and as such are often used for food. They include the *Chondrus crispus*, or carrageen moss (which see); the *Rhodomenia palmata*, or dulse; and the *Plocaria tenax*, extensively used by the Chinese as a glue and varnish. The name has latterly been limited to sea-weeds otherwise known as the rose-tangles, consisting of delicate thread-like branched and jointed plants of a rosy colour with spores forming masses without definite order surrounded by a gelatinous envelope. They chiefly inhabit the seas of the temperate zones, and grow on stones or the larger algæ.

CERAMICS, Ceramic Art, that department of plastic art which comprises all objects made of baked clay, as vases, urns, cups, and dishes of all kinds, statuettes, bas-reliefs, &c., and including all the varieties of earthenware and porcelain that can be regarded as works of art, although the restriction of the term to works of art is rather arbitrary. See China-ware, Pottery, Faience, &c.

CERATE, the name of an external medicament, more or less liquid, having for its basis wax and oil. The absence of fatty substances distinguishes it from pomatums, and of resinous substances from ointments. Cerates are either simple or compound. The one most commonly used is known by the name of Galen's cerate, and is prepared with four parts of white wax, sixteen of sweet almond oil, and twelve of pure water, or distilled water of roses. The wax is melted in the heated oil, and when the mixture is lukewarm, or nearly cool, the water is introduced drop by drop, while the whole is shaken so as to make the incorporation complete. Compound cerates are just Galen's cerate, with the addition of different substances, according to the intended use, as tonics, astringents, narcotics, alteratives, &c. They are used in various surgical cases, being applied as emollients to inflamed or chapped surfaces, and as stimulants to indolent ulcers. They are also useful in excluding the air from wounds, and in preventing the dressings from adhering.

CERBERUS, a three-headed dog, with snakes for hair. Hesiod describes him as fifty-headed, and states him to have been the offspring of Echidna by Typhon, the most terrible of the giants that attempted to storm heaven; but later writers give him only three heads. At his bark hell trembled, and when he got loose from his hundred chains, even the Furies could not tame him. He watched the entrance of Tartarus, or the regions of the dead, and fawned on those who entered, but seized and devoured those who attempted to return. He was subdued by Heracles (Hercules).

CERCELÉE, or Recercelée, in heraldry applied to a cross, the ends of which are curled or twisted like a ram's horn.

CERE, the naked skin that covers the base of the bill in some birds, as in those of the hawk tribe.

CEREALIA (from *Ceres*, the goddess of the fields and of fruits) signified the productions of agriculture, also the festivals of Ceres, celebrated at Rome. The time at which they were celebrated is not known.

According to some, it was the ides (13th) of April; according to others, the 7th of the same month.

CEREALS, a term derived from Ceres, the goddess of corn, though sometimes extended to leguminous plants, as beans, lentils, &c., is more usually and properly confined to the Gramineæ, as wheat, barley, rye, and oats, which are used as human food. In agriculture they are usually considered as exhausting crops, partly on account of their trailing roots; their mode of nutrition, which is effected more by the roots than by the leaves; their slender stems, which allow weeds to grow up and rob the soil; and from the necessity of allowing them to attain full maturity before they are reaped. Accordingly, it is considered one of the rules of good husbandry not to take two cereal or white crops in succession, but to make them alternate with root crops, which, growing in rows at some distance apart from each other, have the additional advantage of allowing weeds to be destroyed by means of repeated hoeings.

CEREBRUM and CEREBELLUM. See BRAIN.

CEREMONIAL OF THE EUROPEAN POWERS. One of the many ridiculous usages and pompous nullities, of which such a number have arisen in Europe, is the subject of this article; which has given rise to much war and confusion, and thrown many obstacles in the way of peace. No independent state can actually have precedence of another; but as the weaker seek the protection and friendship of the more powerful, there arises a priority of rank. This has occasioned the gradual establishment of dignities, rank, and acts of respect to states, their rulers, and representatives, by which means (in contradistinction to the internal etiquette of a state) an international ceremonial has been formed, to the observance of which far more consideration is often paid than to the fulfilment of the most sacred contracts. Louis XIV. carried this folly further, perhaps, than any one before or after him. To this international ceremonial belong,

1. Titles of rulers. Accident made the imperial and regal titles the highest, and thus conferred advantages apart from the power of the princes. After Charlemagne, the emperors of the Romans were considered as the sovereigns of Christendom, maintained the highest rank, and even asserted the dependence of the kings on themselves. For this reason several kings in the middle ages, to demonstrate their independence, likewise gave their crowns the title of *imperial*. England, for example, in all its public acts, is still styled the *imperial crown*. The kings of France received from the Turks and Africans a title equivalent to Emperor of France. In progress of time the kings were less willing to concede to the imperial title, of itself, superiority to the royal.

2. Acknowledgment of the titles and rank of rulers. Formerly the popes and emperors arrogated the right of granting these dignities; but the principle was afterwards established, that every people could grant to its rulers at pleasure a title, the recognition of which rests on the pleasure of other powers, and on treaties. Some titles were therefore never recognized, or not till after the lapse of considerable time. This was the case with the royal title of Prussia, the imperial title of Russia, the new titles of German princes, &c.

3. Marks of respect conformable to the rank and titles of sovereigns. To the *royal* prerogatives, so called (which, however, were conceded to various states which were neither kingdoms nor empires, such as Venice, the Netherlands, Switzerland, the electorates), pertained the right of sending ambassadors of the first class, &c. In connection with this there is a much contested point, namely, that of precedence or priority of rank, that is of the right of assuming the more honourable station on any occasion, either personally, at meetings of the princes themselves, or of their ambassadors, at formal assemblies, &c., or by writing, as in the form and signature of state papers. There is never a want of grounds for supporting a claim to precedence. As the councils in the middle ages afforded the most frequent occasion of such controversies, the popes often interfered. Of the several arrangements of the rank of the European powers which emanated from the popes, the principal is the one promulgated in 1504 by Julius II., through his master of ceremonies, Paris de Crassis, in which the European nations followed in this order:—(1.) The Emperor of the Romans (Emperor of Germany); (2.) the King of Rome; (3.) the King of France; (4.) the King of Spain; (5.) of Arragon; (6.) of Portugal; (7.) of England; (8.) of Sicily; (9.) of Scotland; (10.) of Hungary; (11.) of Navarre; (12.) of Cyprus; (13.) of Bohemia; (14.) of Poland; (15.) of Denmark; (16.) Republic of Venice; (17.) Duke of Bretagne; (18.) Duke of Burgundy; (19.) Elector of Bavaria; (20.) of Saxony; (21.) of Brandenburg; (22.) Archduke of Austria; (23.) Duke of Savoy; (24.) Grand-duke of Florence; (25.) Duke of Milan; (26.) Duke of Bavaria; (27.) of Lorraine. This order of rank was not, indeed, universally received, but it contained a fruitful germ of future quarrels; some states, which were benefited by the arrangement, insisting upon its adoption, and others, from opposite reasons, refusing to acknowledge it. To support their claims for precedence the candidates sometimes relied on the length of time which had elapsed since their families became independent, or since the introduction of Christianity into their dominions; sometimes on the form of government, the number of crowns, the titles, achievements, extent of possessions, &c., pertaining to each. But no definite rules have been established by which states are designated as being of the first, second, third, fourth, &c., rank. Rulers of equal dignity, when they make visits, concede to each other the precedence at home; in other cases, where the precedence is not settled, they or their ambassadors take turns till a compromise is effected in some way. In Britain and France far less ceremonial is observed, in the official style, than in Germany, where forms and titles are carried to an absurd extent, and the ceremonial words, which extend even to the pronouns by which the princes are designated, it is not possible to translate. Emperors and kings mutually style each other *brother*, while they call princes of less degree *cousin*. The German emperors formerly used the term *thou* in addressing other princes. The *we*, by which monarchs style themselves, is used either from an assumption of state or from a feeling of modesty, on the supposition that *I* would sound despotical, while *we* seems to include the whole administration, &c.

CERES, the name given by the Romans to the Greek goddess Demeter, when her worship was introduced into Rome. The origin of the name cannot be explained with certainty. It is not Latin; but some think that it was Etruscan, among whom, according to Servius, Ceres was one of the Penates. Others think that Ceres may be the same with the Greek Cora, or Core (that is, 'maiden'), another name for Persephone, the daughter of Demeter, with whom Demeter herself was often confounded. The worship of Demeter, or Ceres, was introduced into Rome from Sicily at the beginning of the fifth century B.C., and the first temple to her was vowed by the dictator A. Postumius Albinus, 496 B.C. Her worship soon acquired a considerable degree of political importance. As usual when the Romans introduced the worship of a foreign divinity into their own city, they adopted all the legends connected with that divinity, adapting them to their own mythology. Thus, since Demeter was said by the Greeks to be the daughter of Kronos and Rhea, and accordingly sister of Hera, Aïdes (or Hades), Poseidōn, Zeus, and Hestia, so Ceres was regarded by the Romans as the daughter of Saturn and Ops, and sister of Juno, Pluto, Neptune, Jupiter, and Vesta; and so also the Persephone of the Greeks became the Proserpine of the Romans. See Demeter.

CEREUS, Night-blooming. See Cactus.

CERIGNOLA, a town of South Italy, in the province of and 24 miles S.E. from Foggia. It has a college, several convents, and an hospital. The inhabitants manufacture linen; and the district produces large quantities of almonds and cotton. In 1503 the Spaniards, under Gonzales, duke of Cordova, here defeated the French, when the Duke de Nemours, who commanded the latter, was slain. Pop. (1881), 22,659.

CERIGO, or Kerigo (anciently *Cythera*), an island in the Mediterranean, separated from the Morea by a narrow strait. It formerly belonged to the Ionian Republic of the Seven Islands, but since 1864 has been part of the Kingdom of Greece; area about 100 square miles. Cerigo, with the neighbouring islands, now forms one of the eparchies belonging to the province or nome of Argolis and Korinthia. The population of Cerigo in 1896 was 12,306. It is rather rocky and mountainous, yet some of the valleys are fertile. It produces grain, wine, olives, and other fruits. Sheep and goats constitute the chief live stock. Hares, quails, turtles, and falcons are abundant. The people are of Greek origin, and are all of the Greek Church. At an early period a Phœnician colony was founded here; before 570 B.C. it came into the possession of the people of Argos, then into that of the Spartans. It was conquered by the Athenians during the Peloponnesian war, B.C. 424; but they were afterwards obliged to give it up. In B.C. 393, however, it was again captured by them, and retained till it fell into the hands of the Romans. At the division of the Roman Empire it became part of the Empire of the East, and remained so till it was taken by the Venetians. In 1571 it was laid waste by the Turks; in 1715 it was captured by them; but in the Peace of Passarowitz, in 1718, it was once more assigned to Venice. With the rest of the Ionian Islands it was annexed to France in 1807; two years later it was occupied by the English; and since 1815 it has shared the fate of the Ionian Islands. It was anciently sacred to Aphrodite (Venus), who was hence called *Cytheræa*.

CERIGO, or Kapsali (anciently *Cythera*), a town on the S.W. coast of the island of Cerigo, defended by a castle, situated on a sharp rock surrounded by the sea, with a small harbour; pop. 1200. It is the see of a Greek bishop.

CERINTHUS. See Gnostics.

CERIUM, a rare metal, which was discovered in 1803, by Hisinger and Berzelius, in a Swedish mineral known by the name of *cerite*. Dr. Thomson subsequently found it, to the extent of 34 per cent., in a mineral from Greenland, called *allanite*, and it occurs in a few other minerals, in all of which it is accompanied by the rare elements *lanthanum* and *didymium*. The separation of these substances is effected only by a series of complex operations, and then the cerium is got as a powder, which acquires a metallic lustre by pressure. It compounds with oxygen, chlorine, and other elements, and several of its salts have recently been studied, and the oxalate of cerium has been used in medicine. The metal readily oxidizes, decomposes in water, and is soluble in dilute acids.

CERQUOZZI, Michel Angelo, a Roman painter of the seventeenth century, who received the surname *delle battaglie* (battle-painter), and at a later period that of *delle bambocciate*, because, in imitation of Peter Laar, he painted ludicrous scenes taken from low life, such as that to be seen at fairs and markets, and among the Lazzaroni. He latterly painted flowers and fruit. He was born at Rome in 1602, and died in 1660.

CERRETO (ancient *Cernetum*), a town in Italy, Naples, province of Benevento, 11 miles E.S.E. from Piedimonte, on the slope of Mount Matese, near the right bank of the Cusano. It is one of the best built and most agreeable towns in the province, and has a handsome cathedral, containing some good paintings; a collegiate church, three convents, a seminary, two *monts-de-piété*, and several manufactories of coarse cloth. In conjunction with Telese it forms an episcopal see. Good wine is grown in the neighbourhood. In 1656 the plague carried off half the inhabitants, and in 1688 an earthquake destroyed the town. Pop. 5343.

CERRO DE PASCO, capital of the department of Junin, in the Republic of Peru, in South America, at the northern extremity of the plateau of Bourbon, according to Rivero 4352 metres (14,275 feet) above the level of the sea. The town came into existence in 1630, in consequence of the discovery of veins of silver there by an Indian. The streets are narrow and crooked, and the houses small and without windows or balconies. The inhabitants are a mixture of all races and nations, who make their living by the produce of the mines, and who generally squander a great part of their gains in gaming and dissipation. The climate of Cerro de Pasco is wretched, and altogether the place is so destitute of attractions, with the single exception of its wealth in silver, that nothing but the desire of speedily becoming rich could induce people to live in it. The mean temperature by day is said to be about 44° Fah., and by night about 35° Fah. From October to July hail-storms, mists, and snow-falls make the place almost intolerable, and in summer, with the exception of a few clear days, it is said to be little better. In addition to this, on account of the extreme rarity of the air at such an elevation, the difference in temperature in the sun and in the shade is so great that, we are told, on one side of a street one may be exposed to oppressive heat, while on the other side some protection is required against the cold. From this great rarity of the air it also results that strangers, until their constitutions have adapted themselves to the climate, are subject to a disease caused by imperfect respiration. Cerro de Pasco still contains the most productive mines in all Peru, although they no longer yield the almost fabulous wealth that the Spaniards are said to have derived from them. Many of the shafts leading down to the veins of silver are in the town itself, and have their openings either in little huts or in the dwellings of the owners of the mines. According to the greater or smaller depth of the diggings they are called *minas* or *cortes*. The silver is found partly pure, and partly in ores containing from 25 to 80 per cent. of the precious metal. The pop. is said to be about 14,000, but it is very variable.

CERTALDO, a town of Tuscany, partly on a conical height, and partly on a flat along the right bank of the Elsa, 15 miles S.W. from Florence, with 2113 inhabitants. It is the birth-place, was long the home, and now contains the ashes of Boccaccio. His house is still shown, and in one of its rooms are collected numerous relics of the author of the Decameron, and a large fresco painting of him by Benvenuti of Florence.

CERTIORARI, in law, a writ, the purport of which is to remove convictions, orders or proceedings before magistrates, indictments, and records in civil actions *before* judgment, from inferior courts into the courts above, with a view that the party may have justice done to him, or that the superior court may see whether the justices or court below, before which the proceedings have taken place previously to the certiorari being obtained, have kept within the limits of their jurisdiction. In *criminal* cases a certiorari lies to remove all indictments, coroners' inquisitions, summary convictions by magistrates, &c., to the Queen's Bench, which is the sovereign ordinary court of justice in criminal causes. This writ, from the moment of its delivery to the judges of the court below, or magistrate, suspends their power, and any subsequent proceedings by them are void and *coram non judice*. Although the writ of certiorari removes the record from the inferior court into the court above, yet the court above does not take up the cause where the proceedings stopped, but begins *de novo*.—A *Bill of Certiorari* is the name given to an original bill praying for relief by a writ of certiorari, that is, praying that a suit pending in one of the inferior courts of equity may by such a writ be removed to the Court of Chancery.

CERUSE, or **Cerusite**, native carbonate of lead, though not very common is, next to galena, the most abundant ore of lead. It occurs in forms belonging to the rhombic system, and the crystals are sometimes of great purity and lustre, and possess the property of double refraction. At other times it is less transparent, and has various colours. Its specific gravity is 6·4 to 6·6. When heated it decrepitates, and is converted into oxide of lead; it dissolves with effervescence in nitric acid. It occurs in Scotland in the Leadhills, in England in Derbyshire, and many other localities, and on the Continent and in America. The name ceruse is also given to the several basic carbonates of lead, which are manufactured in a variety of ways, and constitute the white-lead of commerce.

The Dutch process for white-lead consists in placing gratings, plates, rolls, or other forms of metallic lead over vessels containing acetic acid or vinegar, and imbedding the whole in a layer of new and spent oak-bark, as used in tanning. A pile or stack of these vessels contains as much as 50 tons of lead. After a time the tan begins to ferment, the temperature rises, and the acetic acid rising in vapour forms a subacetate with the lead. This is then decomposed by the carbonic acid arising from the fermenting tan, and is changed into white-lead. The process thus goes on continuously until the metal is converted into white-lead. The stack is then taken down, and the masses of carbonate, which retain the form of the original casting, are ground, and by elutriation are reduced to an impalpable powder, which is afterwards mixed with oil.

The French process consists in making a solution of subacetate of lead, or a mixture of litharge and normal acetate, and passing through it a stream of carbonic acid, obtained from a lime-kiln or from burning coke, or by the decomposition of a carbonate with an acid.

In the grinding of the carbonate the dust, if inhaled, produces *painter's colic*. White-lead is often adulterated with chalk and with heavy spar or sulphate of barium. Both of these adulterants impair its body or opacity, but make its blackening with sulphuretted hydrogen less conspicuous.

CERUTTI, **Giuseppe Antonio Gioachimo**, one of the last members of the order of the Jesuits (previously to its dissolution in 1773), and one of their most eminent professors in the College at Lyons, was born at Turin, June 13, 1738. His Apology for the Jesuits attracted much attention. He had already published two discourses upon the means of preventing duels, and on the reasons why modern republics have not reached the splendour of the ancient. The last received the prize of the Academy of Dijon. The Apology for the Jesuits gained him the favour of the dauphin. He was at Paris when the revolution broke out in 1789. His principles, and perhaps a desire of revenging the humiliations which he had experienced as a defender of the Jesuits, made him one of the most zealous supporters of the new order of things. He was intimately connected with Mirabeau, and laboured much for him. He also published several pamphlets, among which was a Mémoire sur la Nécessité des Contributions Patriotiques. In 1791 he was a member of the Legislative Assembly. Some time after he delivered, in the Church of St. Eustache, a funeral discourse upon Mirabeau. Exhausted by his zealous exertions, he died Feb. 1792. The city of Paris called a street after his name.

CERVANTES SAAVEDRA, **Miguel de**, one of the greatest writers of modern times, was born at Alcala de Henares, October 9, 1547. His parents removed from this place to Madrid when he was about seven years old. Their limited means made it desirable that he should fix on some professional study; but he followed his irresistible inclination to poetry, which his teacher, Juan Lopez, encouraged. Elegies, ballads, sonnets, and a pastoral, Filena, were the first productions of his poetical genius. Poverty compelled him to quit his country at the age of twenty-two, to seek maintenance elsewhere; he went to Italy, where he became page to the Cardinal Giulio Acquaviva, in Rome. In 1570 he served under the Papal commander, Marco Antonio Colonna, in the war against the Turks and African corsairs, with distinguished courage. In the battle of Lepanto, in 1571, he lost his left hand. After this he joined the troops at Naples, in the service of the Spanish king. In 1575, while returning to his country, he was taken by the corsair Arnaut Mami, and sold in Algiers as a slave. He remained in slavery for seven years. Servitude, far from subduing his mind, served to strengthen his faculties. Vincente de los Rios and M. F. Navarrete, his chief biographers, relate the bold but unsuccessful plans which he formed to obtain his freedom. In 1580 his friends and relations at length ransomed him. At the beginning of the following year he arrived in Spain, and from this time lived in seclusion, entirely devoted to the muses. It was natural to expect something uncommon from a man who, with inexhaustible invention, great richness of imagination, keen wit, and a happy humour, united a mature, penetrating, and clear intellect, and great knowledge of real life and mankind in general. But it rarely happens that expectation is so much surpassed as was the case with Cervantes. He began his new poetical career with the pastoral novel Galatea (1584), in which he celebrated his mistress. Soon after the publication of this he married. Being thus obliged to look out for more lucrative labour he employed his poetical genius for the stage: and in the course of ten years furnished about thirty dramas, amongst which his tragedy called Numancia is particularly valued. He was not so successful in another kind of drama particularly favoured by the Spaniards, a tangled mixture of intrigues and adventures; and this was doubtless the cause of his being supplanted by Lope de Vega, who was particularly qualified for this kind of composition. He consequently gave up the theatre, but it seems not without regret. From 1588 to 1599 he lived retired at Seville, where he held a small office. He did not appear again as an author till 1605, when he produced the first portion of that work which has immortalized his name—Don Quixote. Cervantes had in view, by this work, to reform the taste and opinions of his countrymen. He wished to ridicule that adventurous heroism with all its evil consequences, the source of which was the innumerable novels on knight-errantry. The beginning of the work was at first coldly received, but soon met with the greatest applause, in which, at a later period, the whole of Europe joined. Cervantes' true poetical genius was nowhere so powerfully displayed as in his Don Quixote, which, notwithstanding its prosaic purpose and its satirical aim, is full of genuine poetry. While it struggles against the prevailing false romance of the time, it displays the most truly romantic spirit. The extraordinary good fortune of the work did not extend to the author. All his attempts to better his condition were unsuccessful, and he lived contented with his genius and his poverty, and a modest though proud estimation of his merits. After an interval of some years he again appeared before the public in 1613, with Twelve Novels (which may be placed by the side of Boccaccio's), and in 1614 his Journey to Parnassus—an attempt to improve the taste of his nation. In 1615 he published eight new dramas, with intermezzos, which, however, were indifferently received. Envy and ill-will, in the meantime, assailed him, and endeavoured to deprive the neglected author of his literary fame; for which the delay of the continuation of Don Quixote afforded the pretext. An unknown writer published, under the name of Alonzo Fernandez de Avellaneda, a continuation of this work, full of abuse of Cervantes. He felt the malice of the act painfully, but revenged himself in a noble manner by producing the continuation of his Don Quixote (1615), the last of his works which appeared during his lifetime; for his novel Persiles and Sigismunda was published after his death. He found a faithful friend in the Count of Lenos, and was thus saved from the death of Butler; but poverty, his constant companion through life, remained true to him till his last moments. He died at the age of sixty-eight, April 23, 1616 (on the same day as Shakspeare), in Madrid, where he had resided during the last years of his life. He was buried without any ceremony, and not even a common tombstone marks the spot where he rests. In addition to his celebrity as an author, he left the reputation of a man of a firm and noble character, clear-sighted to his own faults and those of others. Among the best editions of Don Quixote are the one published at Madrid by Joaquin Ibarra, in 1780, which is considered a masterpiece of typography; that of Pellicer (Madrid, 1798), and that of D. Diego Clemencin, with an excellent commentary (Madrid, 1833–39). Many of his works are translated; Don Quixote into all the languages of Europe. Among the English translations may be mentioned those of P. A. Motteux (Lond. 1719); Charles Jarvis (Lond. 1742); and of T. Smollett (Lond. 1755). Several noteworthy English translations have been made in recent years: by A. J. Duffield, three vols., 1881; J. Ormsby, four vols., 1885; and H. E. Watts, five vols., 1888–89, containing life of the author, notes, bibliography, &c.

CERVIA, a town in Italy, in the province of Ravenna, and 11 miles S.E. of the town of Ravenna, near the Adriatic. It is the seat of a bishop and has a cathedral. West of the town is a marsh containing productive salt-works. Pop. 4000.

CERVIN, Mont (German, *Matterhorn;* Italian, *Monte Silvio*), a mountain, Switzerland, Pennine Alps, on the S. frontiers of canton Valais, about 6 miles W.S.W. Zermatt, from which a road leads to the Col St. Theodule, a pass over the mountain into Piedmont. It is one of the most magnificent objects in nature, being an almost inaccessible obelisk of rock starting up from an immense glacier. to a height scarcely 1000 feet lower than that of Mont Blanc. The glacier, which differs from the lower glaciers in not being included between bold walls, but occupying a vast and desolate table-land, is nearly 10,000 feet above sea-level. The height of the peak is 14,837 feet. It is composed of felspar slate or gneiss. The peak was first ascended by a party of four English travellers and three guides in July, 1865, but three of the party and a guide perished in the descent. See Whymper's Scrambles among the Alps (Lond. 1871). On the summit of the pass, 11,096 feet, are the remains of a rude fortification, supposed to have been erected two or three centuries ago, to prevent incursions from the Valais.

CESAROTTI, Melchiore, one of the most celebrated of the Italian literati of the eighteenth century, born at Padua in 1730, of a noble family. He devoted himself to the belles-lettres, and was soon chosen professor of rhetoric in the seminary in which he was educated. He translated three tragedies of Voltaire—Sémiramis, La Mort de César, and Mahomet. In 1762 he went to Venice, where he translated Ossian into Italian, and was, in 1768, appointed professor of the Greek and Hebrew languages in the University of Padua. Here he published his translation of Demosthenes and of Homer, and his course of Greek literature. After the establishment of the republican government, in 1797, he was appointed by the existing authorities to write an Essay on Studies. In this he made suggestions for the improvement of education. In 1807 appeared his poem called Pronea (Providence), in praise of his benefactor, Napoleon, who made him the same year knight of the Iron Crown. In spite of his advanced age he subsequently occupied himself with an edition of all his works, which he had commenced in 1800; but his death in 1808 prevented the completion of this enterprise. The edition of his works that had been begun during his life was completed by his friend Giuseppe Barbieri (Pisa, 1805–13).

CESENA (ancient *Cæsena*), a town in Italy, in the province of, and 11 miles S.E. from Forli, on the right bank of the Savio, at the foot of a mountain. It is the seat of a bishopric, is well built, has a handsome town-house, a cathedral, an agricultural society, and some silk-mills. Its trade is principally in the wine and hemp produced in the neighbourhood, and large fairs are held twice a year. There are sulphur mines in the vicinity. Popes Pius VI. and VII. were natives of this town. Pop. (1881), 11,435.

CESIUS, Bernardus, a learned Jesuit, was bo at Modena about 1581, became a professor of philosophy and theology at Parma, and afterwards at Modena, where he died of the plague in 1630. He is best known by his work entitled Mineralogia, sive Naturalis Philosophiæ Thesauri; Lugduni, 1636, in folio, which contains no important observations by the author himself, but is useful as being a laborious collection of everything relating to the mineralogy of the ancients, and as showing what minerals were familiarly known during the author's time.

CESPEDES, Pablo de, one of the most celebrated Spanish artists, equally distinguished as a painter, sculptor, architect, poet, and literary character, was born at Cordova in 1538, and turned his attention at first to scientific pursuits. In 1556 he entered the university of Alcala de Henares, where he distinguished himself by his proficiency in the classics and oriental languages— no ordinary acquirements in that age. He also assiduously cultivated his genius for the fine arts. Having at last made these his principal pursuit, he proceeded to Rome, studied under Zucchero and Michael Angelo, and soon became renowned both for his frescoes and sculptures. In 1577 he obtained a prebend in the cathedral of Cordova, and from that time resided alternately in his native town and in Seville. He died in 1608. His best pictures are in Cordova, Seville, Madrid, and several towns of Andalusia; and are admired particularly for elegance and loftiness of design, complete knowledge of anatomy, the skilful employment of light and shade, warmth of colouring, accuracy of expression, and spirituality of composition. One of his most celebrated pictures is a Lord's Supper, in Cordova Cathedral. He was the head of the then Andalusian school of painting, and numbered among his pupils some painters of distinction.

CESSART, LOUIS ALEXANDER DE, one of the most celebrated French engineers, born at Paris in 1719, early entered the military service, and distinguished himself in the campaigns of 1743–46, during which he was present at the battles of Fontenoy and Rocoux. Bad health having obliged him to obtain his discharge, he entered the École des Ponts et Chaussées, where he displayed so much genius and industry, that in 1751 he was appointed general engineer of Tours. In 1775 he was removed to Rouen, and in 1781 proposed his plans for the construction of the harbour and works of Cherbourg. These have immortalized his name. He died in 1806, while engaged in preparing a description of his most important labours. The work was published under the title of Description des Travaux Hydrauliques de L. A. Cessart (two vols. 4to; Paris, 1806 and 1809).

CESSIO BONORUM, a surrender of goods, the name given to a process by which, according to the law of Scotland, a debtor against whom a warrant of imprisonment was issued after being charged to pay his debt, was entitled to be free from imprisonment, if innocent of fraud, on surrendering his whole estate to his creditors. Since the abolition of imprisonment for debt a debtor may be compelled to make *cessio bonorum* at the instance of a creditor.

CESTIUS, the name of a plebeian gens at Rome, of which two memorials have been preserved, one of them a bridge connecting the island of the Tiber with the right bank of that river, and the other a monumental pyramid standing at the gate San Paolo, partly within and partly without the walls of Aurelian. This pyramid stands upon a base of travertine. It is 125 feet high, and at the base 95 feet broad. It is built of bricks, encased in blocks of marble. In its interior there is a sepulchral vault 20 feet long, 13 feet broad, and 14 feet high. The walls of this vault were formerly decorated with paintings, but these are now faded, and only a few traces of them are still discernible. Two marble pillars which formerly supported the statue of the person whom the monument commemorates, stand in front of the pyramid. From the inscriptions still seen upon it, it has been inferred that the Cestius who caused this magnificent monument to be erected was a Roman knight of that name who lived in the time of Cicero, and who, having enriched himself in Asia Minor, left part of his wealth for the purpose of perpetuating his memory in this way.

CESTUS (Gr. *kestos*), a girdle worn by Aphrodite or Venus, endowed with the power of exciting love towards the wearer. The following is Pope's translation of Homer's description of it:—

> In it was every art and every charm
> To win the wisest, and the coldest warm—
> Fond love, the gentle vow, the gay desire,
> The kind deceit, the still-reviving fire,
> Persuasive speech, and more persuasive sighs,
> Silence that spoke, and eloquence of eyes.

Forcellini says, '*Fingunt poetæ, intextas habere cupiditates, voluptates, delicias, illecebras, suspiria, desideria, risus, jocos, blanda verba, gaudia, jurgia, et hujusmodi quibus amatorum vita constat.*' This beautiful fiction has been happily imitated by Tasso, in his description of the girdle of Armida.

CETACEA. The aquatic mammals included under this order depart in many important anatomical points from the other members of the class, their structure being so modified as to render them unfit for terrestrial life. The whale-bone whales, the toothed whales, as the porpoise, narwhal, &c., and the extinct zeuglodon, represent the leading divisions of the group. The body is fish-like in form, the head passing gradually into the trunk, which tapers posteriorly and ends in a bilobate caudal fin which is placed horizontally, not as in the fishes, vertically. The posterior limbs are wanting, and the anterior are converted into broad paddles or flippers, consisting of a continuous sheath of the thick integument, within which are present representatives of all the bones usually found in the fore-limb of mammals, but they are not movably articulated, so that the paddle moves like a solid oar. The fish-like aspect is further increased by the presence of a dorsal fin, as in the dolphin and finner whale (see accompanying plate, fig. 7, 13); but this is a simple fold of integument, and does not contain, as in fishes, any bony spines. The vertebræ of the neck, seven in number, are united more or less to each other, so that, as in the bottle-nosed whale, they form a single solid piece. The right whale (fig. 11) and its allies have no teeth in the adult state, their place being taken by the triangular plates of *baleen* or whalebone which are developed on transverse ridges of the palate. The frayed edges of these plates slope obliquely downwards and outwards from the middle of the roof of the mouth, so that when the mouth is shut there is a triangular space in the middle, the floor of which is formed by the enormous tongue. The water taken into the mouth is sifted by the frayed edges of the plates; it is driven out sideways between the plates, and the tongue sweeps backwards to the gullet any animals that have been caught in the fringes. But the fœtal whales possess minute teeth, which are very soon lost. The porpoises, &c. (fig. 7–10), when they possess teeth in one or both jaws, have them numerous and conical in form; they have no milk predecessors. The stomach is divided into several chambers, but these are not, as in ruminants, connected directly with the gullet; they are rather appendages of the pyloric portion of the organ. The arrangements of the respiratory and circulatory systems, which enable the Cetacea to remain for some time under water, are interesting. The nostrils open directly upwards on the top of the head, and are closed by valvular folds of integument which are under the control of the animal. When the animal comes to the surface to breathe it expels the air violently, and the vapour it contains becomes condensed into a cloud: if expiration commences before the mouth of the spiracle or blow-hole is above the surface, a little water may be blown up like spray, but no water from the mouth is thus discharged, for the soft palate firmly embraces during life the upper end of the larynx, so that the gullet is divided into two narrow passages, while the lungs have a continuous passage to the exterior. The blood-vessels, especially those of the thorax and spinal canal, break up into extensive plexuses or networks, in which a large amount of oxygenated blood is delayed, and thus the animal is enabled to remain under water, the necessity for changing the air in the lungs being diminished. Professor Owen has pointed out that an injury to these dilated vessels leads to profuse hemorrhage, and that thus the whale is killed by the comparatively trifling wound of the harpoon. The suborders of the Cetacea are as follows:—

1. The toothed whales (*Denticete* or *Odontocete*). The family *Delphinida* comprises the grampus (*Orca*), with a very high dorsal fin; the *Beluga* or white fish, without dorsal fin, and with teeth which fall out early, the food of the animal being chiefly cuttle-fishes, which it catches in open ocean; the *Phocæna* or porpess, with sharp-edged teeth: this genus feeds on fish, and often gets stranded in pursuit of the shoals of mackerel and herring. The porpess and also the grampus are seen in herds tumbling in such fashion as to suggest that they are performing somersaults. In reality, they alternately raise the head so as to bring the spiracle above the water for breathing, and allow it to sink again. The movements of a herd of these animals following each other in line, have had much to do with tales of the undulations of the sea-serpent. When they are in active pursuit of prey they swim straight forward with open mouth, the arrangement of the nostrils already described preventing the air-passages from being filled with water. The bottle-nosed whales (*Globicephalus*), with twelve to fourteen teeth in each half of the jaw, and the fish-eating dolphins, with more numerous teeth, are frequent visitors from the North Sea to British shores, the *Inia* of the Amazon estuary being their southern representative. The Ganges has a single genus and species, the susu (*Platanista Gangeticus*), with a narrow parallel-sided beak. The narwhal (*Monodon*) is the type of a distinct family, of which the females have two imperfectly developed tusks of equal size embedded in the upper jaw, while in the male one of them develops into the long spirally-twisted horn (fig. 9), the dense ivory of which is sought after for certain ornamental purposes; the skull is unsymmetrical, and the rest of the teeth drop out early. In the nearly allied family of the Ziphioid or Hyperoödont dolphins the elongated beak is solid, in some fossil species very solid, and the lower jaw has only one or two functional teeth in either half, the remainder being absent, or remaining small and embedded in the hard gum. Members of this family are found in northern and southern oceans, and occur fossil in the crag deposits of England. The cachalot or sperm whale is the best known example of the Physeters or *Catodont* family, the head of which is very large, and forms as much as a third of the whole length. In the concavity of the forehead is lodged the spermaceti, for which the animal is sought after. This is a soft fat lodged in the cellular tissue, which quickly hardens on exposure to the air. The cachalot feeds on cuttle-fishes, and it is probably from their tissues that the ambergris is derived, which is found, like the bezoar stones, in the alimentary canal. The family derives its name, Catodont, from the presence of teeth in the lower jaw only.

2. The *Mysticete*, or edentalous whales, form three groups, of one of which the Greenland or right whale (*Balæna mysticetus*) is the type. The whalebone plates, already described, are long and thin; there is no dorsal fin, but the paddles are very broad. Although this family contains the largest mammals, the length of some individuals exceeding 60 feet, the gullet is exceedingly narrow, and their food consists almost entirely of the small mollusca and crustacea found floating near the surface of the open ocean. The whales strain the water, often discoloured by the large numbers of these small animals, and thus, the gape being above 10 feet long, secure with each mouthful a great mass of animal life. The disproportion of the mouth to the size of the brain-case is well seen in fig. 12. The rorqual (*Physalus boops*), the razor-back (*Physalus antiquorum*), the hump-back (*Megaptera*), and the finner (*Balænoptera*, fig. 13) differ from the right whales in having a dorsal fin usually near the posterior end of the body, and in having the paddles longer than broad. Members of this group are found both in the northern and southern seas.

3. The *Zeuglodonts* form a group that differ from these already described in having simple teeth in the position of the incisors of other mammals, and in having both above and below several molar teeth with sharp serrated margins like those of the seal, and with two roots; further, some of these have vertical successors. The fore-limb had more free motion than that of other Cetacea, since the humerus has articular surfaces on its distal end. Thus the Zeuglodonts which are found fossil in the miocene strata link the Cetacea, by the ziphioid whales, to the aquatic Carnivora, such as the seal.

The cetaceans above mentioned are frequently distinguished as carnivorous from the herbivorous cetaceans comprised in the group *Sirenia*. The combinations of the two under a single order has been objected to on the ground that the Sirenia rather approximate to the pachyderms. The two groups agree in the general fish-like form of the body, but this is less distinct in the Sirenia, in which (see fig. 5) the nostrils are terminal, the head distinct from the body, though the separation is not very strongly marked; the long paddles bear rudimentary nails, and the skin is provided with bristles. The small mouth, the fleshy muzzle, and the position of the teats, which are pectoral, not ventral as in the whales, may, it has been suggested, have had some share in the origin of the mermaid legends of earlier voyagers, the peculiarities of the Sirenia and of the eared seals being mixed up in the tradition. The distribution of this group is peculiar: the lamantin or manatee (*Manatus*) is found on the coasts of tropical Africa and South America, on opposite sides of the Atlantic: the dugong (*Halicore*) in the Indian Ocean, and on the Australian coast: *Rhytina* inhabited the shores of Behring's Straits less than a century ago, but is now extinct. *Halitherium*, found fossil in miocene strata, is the only member of the group which had hind limbs. The skull of the dugong (fig. 4) obviously differs greatly from that of the cetaceans, especially in the shorter and more massive jaws. The incisors of the upper jaw project in the male as two tusks, in the female they are also symmetrically developed, but remained concealed in the premaxilla: those of the lower jaw disappear very early in life. The symmetrical development of the tusks and the enlargement of the bones supporting them has much resemblance to what takes place in the elephant, and the kinship thus suggested to the pachyderms is confirmed by the character of the molar teeth. These are not simultaneously developed in the jaws, but the anterior simple are shed before the more complex posterior ones are in place, the succession from behind forwards being such as prevails in the proboscidean family. The manatee advances a step in respect of its dentition: the crowns of the molars are covered with enamel; they have two or three transverse tuberculated ridges, those of the upper jaw have three, of the lower jaw two divergent roots. Some of the molars, moreover, have milk predecessors. In Rhytina horny ridges of the mucous surface above and below do the work of teeth which were not present. The stomach of the existing genera is divided into a cardiac and a pyloric cavity, as in Cetacea, and the pyloric is here also provided with cœcal appendages. Without giving a decided opinion on the question of classification, it seems advisable to bring the two groups into close proximity, since, even though the Cetacea lead towards the Carnivora, and the Sirenia towards the Ungulata or hoofed quadrupeds, there are resemblances in structure and analogies in mode of life which justify us in regarding them as, superficially at least, a natural assemblage. See the articles Dugong, Manatee, and Rhytina.

CETTE, a seaport and fortified town of France, in the department of Hérault, 19 miles south-west of Montpellier, upon a peninsula between the Mediterranean and Lake Thau, into which the great canal of Languedoc enters. The port, which is safe and has been very much deepened, is guarded by the Forts St. Pierre and St. Louis. The town is dirty and without striking buildings. After Marseilles, Cette is the principal trading port in the south of France, and it is much resorted to as a watering-place. Its commerce in woollen, cotton, and silk goods, leather, wine, salt, oil, verdigris, soda, pilchards, tobacco, soap, &c., is large. It has extensive cooperages, establishments for the artificial preparation of wines, and important fisheries. Pop. (1896), 32,729.

CETTIGNÉ, Cetinje, the capital of Montenegro, a village in a valley, about 13 miles E. of Cattaro. It is the residence of the prince, and consists of the palace, the government buildings, an arsenal, theatre, girls' school, &c. Pop. about 1200.

CEUTA (anciently *Abyla*, called by the Moors *Sebta*), a strongly fortified place in Marocco, possessed by the Spaniards, lying on the African coast of the Mediterranean, upon a peninsula opposite Gibraltar. It is included in the province of Cadiz and is the seat of a bishop. The harbour is bad. Ceuta formed part of the Roman colony of *Ad Septem Fratres*, so named from the seven hills in the neighbourhood. One of these, Abyla, now Monte del Acho, formed with the opposite rock of Gibraltar (Calpe) the pillars of Hercules. The Portuguese possessed themselves of this city in 1415. With Portugal it was included in 1580 in the Spanish monarchy by Philip II., and remained under the Spanish government after the revolution of 1640. In the Treaty of Lisbon in 1668 Portugal ceded it to Spain. Ceuta is one of those Spanish *presidios* which are used only for commerce, and as places of transportation for exiles or criminals. Pop. (1887), 10,744.

CEVALLOS, Don Pedro, born of an ancient Castilian family at Santander in Biscay in 1761, studied at Valladolid, and entered on a diplomatic career. Having been appointed secretary to the embassy at Lisbon, he there married a niece of Manuel Godoy, duke of Alcudia, the Prince of Peace, and became afterwards minister of foreign affairs. In the disputes between Charles IV. and his son Ferdinand he adhered to the latter, accompanied him to Bayonne, and there witnessed the intrigues and violence by which the Bourbons were ousted from the throne of Spain to make way for the Bonapartes. Aware of the influence which Cevallos possessed over the Spanish people, Joseph Bonaparte was anxious to gain him over, and offered to take him into his service. Cevallos accepted with apparent willingness, but on arriving at Madrid united with the Spanish junta against Joseph, and was sent by them on a mission to London, where in 1808 he published his celebrated work on Spanish affairs, referring more especially to the proceedings at Bayonne. After the restoration he for some time maintained a great influence over Ferdinand, but on his opposing the marriage of the latter with a princess of Portugal he lost favour, was deprived of his office of secretary of state, and sent as ambassador to Naples and Vienna. On being recalled in 1820 he retired into private life, and then withdrew to Bayonne, where he resided for several years, and died at Seville on May 29th, 1838.

CEVENNES (Latin, *Cebennæ*), a chain of mountains in the south-east of France, the extent of which is variously estimated by geographers. The most restricted view of it, or what is called the Cevennes Proper, limits it to the chain which stretches from the north of the department of Hérault, passes between the departments of Gard and Lozère, and traverses that of Ardèche to the department of the Loire; length about 100 miles. In its widest sense the Cevennes are regarded as comprising the whole of the great chain, or series of chains, which extends from the foot-hills of the Pyrenees in the south to that of the Vosges in the north. In this sense the chain of the Cevennes begins with the Col de Naurouse, west of Castelnaudary (department Aude), where it links with the Pyrenees, and extends either to the Côte d'Or, at the north extremity of the department Saône et Loire, if that chain is considered as a part of the Vosges system, or, according to other authorities, includes the Côte d'Or mountains, and extends to the plateau of Langres, where the Vosges are supposed to begin. From south-west to south-east the chain receives successively the names of Montagnes Noires, Montagnes de l'Espinouse, Montagnes de l'Orb, Monts Garrigues, Montagnes de Gévaudan, Montagnes du Vivarais, Montagnes du Lyonnais, Montagnes du Beaujolais, and Montagnes du Charolais. The whole length of the chain, in this wide sense, exclusive of the Côte d'Or, is about 330 miles. It is divided into two sections, the Northern and Southern Cevennes; the dividing-point is Mount Lozère, in the department of the same name. The general direction of the chain is north-east, as far as Mount Pilat (department Loire), thence north to the Côte d'Or. During its whole length it forms the watershed between the Bay of Biscay and the Mediterranean, separating the basins of the Garonne and Loire, belonging to the former, from those of the Rhone and Saône, belonging to the latter. The east side of the chain is more abrupt than the west side, whose slopes are usually gentle and prolonged to a great distance. The chain forms the chief determining feature of the scenery in the various departments throughout its course. The average height of the southern ranges does not exceed 3000 feet, although Mount Lozère rises to 1702 mètres, or 5582 feet. In the ranges farther to the north Mont Mézenc has a height of 1754 mètres, or 5753 feet. The southern Cevennes are generally composed of calcareous rocks, which form plateaux intersected by valleys. At some points extinct volcanoes, surrounded by masses of basalt, appear. The more northern Cevennes are generally calcareous along the banks of the Rhone, but their west slopes often consist of granite, covered to a great extent with volcanic matter. The effects of ancient eruptions everywhere appear, and sometimes mountains of volcanic origin may be seen. The Cevennes are rich in minerals, containing mines of copper, iron, lead, and coal, and quarries of granite, porphyry, marble, and plaster.

CEVENNES, a district in the south of France, which at one time formed the northern part of the government of Languedoc. During the wars against the Albigenses its mountains and valleys were the asylum of numerous persons who had renounced many of the beliefs of the Roman Church. It now forms part of departments Haute-Loire, Loire, Ardèche, Gard, and Aveyron.

CEYLON (native *Singhala*, ancient *Taprobane*), an island belonging to Great Britain in the Indian Ocean, about 60 miles south-east of the south extremity of Hindustan, from which it is separated by the Gulf of Manaar and Palk's Strait. It lies between lat. 5° 56′ and 9° 50′ N., and between lon. 80° and 82° E., having the shape of a pear, with the broad end south. Length, about 270 miles north to south;

average breadth, 100 miles; area, 25,364 sq. m. The north and north-west coasts are flat and monotonous, those on the south and east bold and rocky, presenting a highly picturesque appearance, which is further heightened by the exuberant vegetation, the noble palm forests, the luxuriant corn-fields, and the verdant slopes of the mountains enamelled with bright flowers, herbs, and creeping plants, whose delicious perfume spreads far and wide. Many parts of the coast, both at its south and north extremities, are studded with small, rocky, and verdant islands, some of them overgrown with palms, and presenting a singularly beautiful appearance. At Trincomalee, on the N.E. coast, there is one of the finest natural harbours in the world; at Galle on the S. coast there is also a harbour; while the harbour at Colombo, the capital, is capable of admitting the largest vessels, and is now the regular calling-station for mail steamers to and from Calcutta, China, and Australia. Between the island of Manaar on the north-west coast of Ceylon and the island of Ramiseram on the coast of India, is a ridge of sand-banks called Adam's Bridge, which nearly connects Ceylon with the continent, being intersected only by three narrow shallow passages, the remainder being covered with 2 or 3 feet of water at full tide. These channels admit only very small vessels, but ships of some size can get through between Ramiseram and the mainland; and schemes for the passage of larger vessels have been projected, as also for a railway along Adam's Bridge.

Mountains, &c. — The mountainous regions of Ceylon are confined to the centre of the south and broader part of the island. They gradually diminish to hills of moderate elevation as they recede from the central mass, and are succeeded on the west side by a flat tract extending to the coast. Their average elevation is somewhere about 2000 feet, but there are several summits upwards of 7000 and 8000 feet high. The highest summit is Pedrotallagalla (8260), but Adam's Peak, reaching 7420 feet, is the most remarkable from its conical form, the distance from which it is visible from the sea, and from the sacred associations with which it is connected, the summit being the point from which Buddha, according to his followers, ascended to heaven, a gigantic footprint bearing testimony to the fact. Other summits are Tolapella (7720) and Kirrigalpota (7810). The forms of the mountains of Ceylon are singularly varied. They most frequently occur connected in chains, and terminate in round or peaked summits. Their sides are always steep, and occasionally precipitous and rocky. There is no proportional correspondence between the heights of the mountains and the depths of the adjoining valleys, and often the valleys are extremely narrow. The deepest are in the heart of the mountains. Some are between 3000 and 4000 feet deep, and not over half a mile wide.

Rivers and Lakes.—The rivers of Ceylon, though numerous, especially on the south and south-west sides, are small, being merely mountain streams, navigable only by canoes, and that but for a short distance from their mouths. The Mahaveli-ganga, which rises near Adam's Peak, and falls into the sea by a number of branches near Trincomalee, is by far the most important. It has a course of 134 miles, and drains upwards of 4000 square miles. Timber grows on its banks in great abundance, consisting of halmalille, ebony, satin-wood, &c., which is floated down to the harbour during the freshes. Of the remaining rivers the Kalani-ganga, the Kala-ganga, and the Maha Oya reach the sea on the west coast; and the Gintota-ganga at Galle. All the rivers are liable to be surcharged with rain during the monsoon, and to inundate the level country, while the heat of the sun on drying the country produces malaria. There are numerous extensive lagoons or backwaters round the coasts, but no lakes in the island worth noticing, the largest being only 4 miles broad. There are rills and streamlets rushing along in every direction amongst the mountains, so overhung with superabundant vegetation as to be frequently invisible.

Geology and Mineralogy.—Ceylon is mostly formed of ancient stratified rocks, but owing to the obliteration of fossil remains it is doubtful whether they have been deposited on the beds of seas or lakes. The mountains are composed of primary and metamorphic rocks, the prevailing rock on the island being gneiss, though laterite (or 'cabook') and a sort of dolomite also occur in considerable quantity. In the Nuwara-Eliya district and elsewhere there are large alluvial tracts. Basalt is found near Galle and Trincomalee, and at Pettigallakanda an ancient lava occurs. The soil is mostly formed from the disintegration of gneiss. The western coast of the island is believed to be rising. Plumbago is found in sufficient quantities to make it of commercial importance, anthracite is obtained, and among the metals occurring in the island are iron in fair quantity, manganese, gold, platinum, molybdenum, nickel, cobalt, copper, and tin. No coal has been found, but nitre and salt occur (the latter is also a somewhat important article of manufacture). Gems of many kinds are abundant, particularly near Ratnapura. They are found either embedded in the rock or washed down in the alluvium of river-beds, and include zircons, amethysts, cat's-eyes, topazes, moonstones, garnets, spinel, sapphires, rubies, cinnamon stones, &c. There are hot springs at Bintenna, Trincomalee, and Puttalam.

Roads and Railways.—Ceylon is now well provided with roads. A highway has been made from Colombo to Nuwara-Eliya, 6000 feet above the level of the sea. A continuous line, 769 miles in length, makes the entire circuit of the coast, and every town of importance is connected by roads with the two chief cities. The roads in general are good, being frequently macadamized, and in the neighbourhood of the chief towns are adapted for carriages. During the monsoons, however, the roads in many parts are impassable from inundations. The formation and maintenance of roads, bridges, streets, and canals forms one of the chief items of expenditure of the government. Railway extension is also a government affair, and there are now nearly 300 miles in all, the main line being that between Colombo and Kandy (75 miles). In the early part of the nineteenth century there was not a single road in the country, merely a few pathways, the greater part of the island being then covered with impenetrable forests.

Climate.—Where the jungle has been cleared away, and the land drained and cultivated, the country is perfectly healthy; where low wooded tracts, and flat marshy lands abound, covered with a rank, luxuriant vegetation, the climate is eminently insalubrious, showing, what is now pretty well understood, that mere heat has little to do with the unhealthiness of tropical climates. The heat is not so great as on the neighbouring coast of India, the sea-breezes moderating the temperature. At Colombo, on the west side of the island, near the 7th parallel of N. lat., the mean daily variation of the temperature does not exceed 3°, and the annual range is from 76° to 86° 30′ Fah. At Nuwara-Eliya (6000 feet high) the annual range is from 32° to 80°. The east part of the island being exposed to the north-east monsoon has a hot and dry climate, resembling that of the coast of Coromandel; while the west division, being open to the south-west monsoon, has a temperate and humid climate like that of the Malabar coast. The quantity of rain that falls annually in Ceylon is estimated at three times the quantity that falls in England, the rains being less frequent, but much heavier. The interruption which the course of the monsoons meet with from the mountain ranges of the island causes deluges of rain to fall on one side, while the other is parched with drought. At Kandy, in the interior, the average annual fall of rain is 85·3 inches; at Colombo, on the sea-coast, 75 to 80 inches. The prevalent diseases are those of the liver and intestines, often accompanied by fever. Elephantiasis and other cutaneous complaints are common. The very fatal disease called beriberi (*Hydrops asthmaticus*) occasionally occurs, being almost peculiar to the island.

Animals.—Most of the animals found on the opposite continent are native to this island, excepting the royal tiger, which does not exist here. Elephants are numerous, especially in the north and east provinces, where they sometimes do great injury to the growing crops. The elephants of Ceylon are esteemed for their superior strength and docility. The eagerness with which they are hunted has greatly diminished their numbers. Since 1869 licenses for the capture and exportation of elephants have to be got from the government. Bears, buffaloes, leopards, jackals, monkeys, and wild-hogs are numerous. There are several species of deer, of which the elk and fallow-deer (properly the rusa or great axis and the spotted axis) are most abundant. Porcupines, bandicoots, squirrels (flying and other), bats, mungooses are to be found, as are also the pangolin or scaly ant-eater, and the loris or Ceylon sloth. Flying-foxes and rats are numerous. Pheasants, snipes, partridges, pigeons, peacocks, and a great variety of birds, of splendid plumage, are plentiful. Crocodiles, serpents, and reptiles of all sorts abound. Of the snake tribe, consisting of about twenty-six different species, six only are venomous. Among the insects are the leaf and stick insects, the ant-lion, the white ant, &c.

Vegetable Products.—In the luxuriance of its vegetable productions, Ceylon rivals the islands of the Indian Archipelago, and in some respects bears a strong resemblance to them; its most valuable products are tea, rice, coffee, cinnamon, and the cocoa-nut. Coffee used to be the chief cultivated crop, but disease has within recent years much reduced the produce. Cinnamon, called by the Singhalese *corundoo*, grows in the south-west, to which it is almost exclusively confined, requiring a sandy soil with a moist atmosphere. The trade in this spice was reserved as a government monopoly by the Dutch when they had possession of the island; all that was collected beyond the quantity which it was thought could be sold at a monopoly price being burned. This absurd system was followed by the English for some years after their conquest of Ceylon, but was abandoned in October, 1832, when the trade in cinnamon was declared free, subject to a duty on exportation. The cocoa-nut trees grow along the entire west and south coasts in countless numbers, each tree producing from 50 to 100 nuts in the year. Every part of this invaluable tree is capable of being turned to profitable account. The Palmyra-palm, which grows principally in the north part of the island, is of hardly less importance than the cocoa-nut, being productive in seasons of drought, when the crops fail. The jaggery-palm, or *kittul* tree, is cultivated for the sake of its sap, which yields a coarse sugar; its pith furnishes a kind of sago; and its fruit is also eaten. The taliput-palm also abounds, as do the jack and bread-fruit trees, the fruit of which is used by the natives for food, both raw and cooked; the timber, also, of the jack-tree, not being subject to be attacked by the white ant, is much used by the natives for making furniture, and in house-building. The Ceylon areca-nut, celebrated for its superior qualities, is exported in large quantities. Tobacco is raised principally in the north district, and is of excellent quality. Indigo grows wild, but is not sought after. The cardamom plant is abundant, but inferior to that of Malabar; fruits and culinary vegetables are produced, the latter in the elevated districts, in great variety and profusion. The island abounds with timber of various descriptions, including calamander, satin, rose, sapan, iron, jack, halmalille, and other beautiful woods adapted for cabinet work. Agriculture generally, and the cultivation of the more valuable native products of the island in particular, are improving. As already stated, coffee once was the chief crop, but latterly the cultivation of tea, cinchona, and cacao has been carried to such an extent, that the island has become less dependent on a single article of produce. Notwithstanding the acknowledged fertility of Ceylon, the capabilities of its soil where justice is done to it, and the efforts now in progress to develop these capabilities, by far the largest proportion of the island is still uncultivated. There are a few natives who possess considerable estates in land; but the law of inheritance has, for the most part, caused a minute subdivision of the soil, to a degree very unfavourable to its improvement. The British government claims the proprietorship of all the waste lands, which are now disposed of by public sale. Among works carried on by the government are irrigation works in suitable localities, including the cutting of channels, the construction of annicuts or dams, and the formation and repair of tanks. Some of the ancient works of this kind are of great magnitude. There is also a government forest department, part of the work of which is to provide fuel for the railways, and timber for government works.

Pearl-fishery, &c.—There has long been a pearl-fishery on the coast of Ceylon, carried on as a government monopoly. The fishery sometimes fails for years, there having been none, for instance, between 1837 and 1854, or between 1863 and 1874. Although government still continued a strict surveillance over the banks, and occasionally subjected them to a careful examination, scarcely any trace of the pearl-oyster was to be found. No cause has yet been discovered for this disappearance. When the pearl-fishery is in existence it is confined to the Gulf of Manaar, where the oyster-banks extend for sixty or seventy miles along the coast south of Manaar, and perhaps ten thousand people including 2500 divers will assemble in the fishing season. The Ceylon pearls are whiter than those of Ormuz or the Arabian coast. The chank or conch fishery was at one time carried on to a great extent, employing about 600 divers, but has greatly declined owing to the little demand now made for them in Bengal, to which the greater part were sent. The chank is a sea-shell (*Voluta pyrum*), adapted for cutting into rings, these being formerly used in great numbers by the native women of Hindustan for bracelets and anklets.

Manufactures, Trade, &c.—The manufactures of Ceylon are very unimportant, with exception of arrack, which is distilled from the juice of the cocoa-nut tree. The spinning and weaving of cotton goods, generally of the coarsest kind, was at one time a considerable industry, but is now dying out. There are numerous oil-mills for pressing the cocoa-nut kernels to express the oil. The Singhalese make good artisans, as is experienced at Colombo, where they are employed in making steam-engines and other machinery. They are skilful in carpentry and wood-work, expert workers in gold and silver, and excel in the manufacture of lacquered ware. Salt is a government monopoly, being collected from shallow lagoons, which at certain seasons are overflowed by the sea, or it is manufactured in pans, the property of the government. The exports are chiefly tea, coffee, cinchona, cinnamon, cocoa-nut products, areca-nuts, cacao, cardamoms, plumbago, tobacco. Tea has only begun to be exported in recent years, and the export has increased from 2,392,975 lbs. in 1884, to more than 130,000,000 lbs. The total value of exports in 1899 (taking a rupee at 2*s.*) was £11,140,000; of the imports £10,150,000. The trade of Ceylon is chiefly carried on with Great Britain and India, the former of which received from the island in 1899 goods valued at £5,077,758, and sent thither goods to the value of £1,464,760. The chief article exported to Britain is tea, the value of which in 1899 was £3,730,936, while in 1884 it was only £158,969. The only other exports to Britain worth mention are coffee, cocoa-nut oil, and plumbago. The principal articles of import from Great Britain are coals, cotton manufactures, apparel and haberdashery, iron and steel manufactures, machinery, &c. The imports from Great Britain of manufactured cotton goods in 1899 was £227,598, wrought and unwrought iron £138,807, and coals £195,005. From other countries are imported rice, dried fish, wheat, sugar, &c.

Government, &c.—Ceylon is one of the British crown colonies, its government being conducted by a governor and two councils, executive and legislative, of both of which the governor is president. The first is composed of six members, including the governor; the other of seventeen members, including the members of the executive council, four other office-holders, and eight unofficial members selected by the governor as representative of the different classes and interests in the community. The powers of the councils are limited, being wholly subservient to the governor, who can carry into effect any law without their concurrence. All laws must be approved of by the secretary of state for the colonies before they can take effect. Any individual properly qualified may be appointed to the most responsible situation, without reference to service, nation, or religion, and native Singhalese have occupied or occupy some of the highest posts.

The island is divided into nine provinces—the Eastern, Western, Northern, Southern, Central, North-Central, North-Western, Sabaragamuwa, and Uva, and subdivided into districts. In each province is stationed a government agent. For the administration of justice there are in the civil and criminal departments a supreme court, established at Colombo; also a vice-admiralty court, and provincial courts, stationed in various districts; besides magistracies. There are municipalities or local boards in the towns, and there are also native village councils. The chief sources of revenue are the customs duties, railway receipts, land-rents, and salt-farms. Till the 1st January, 1870, duties were levied on the chief articles of export; but these are now free. The revenue for 1898 was £2,513,866; expenditure, £2,284,385. There is a public debt which amounts to about £3,470,000; but the finances are in a very healthy condition, as the public debt of the colony has been mostly incurred for the construction of railways.

People.—The present population of Ceylon is composed of Singhalese, Cingalese, or Ceylonese, descendants of immigrants from Hindustan who entered the country in the sixth century B.C., Malabars or Tamils originally from southern India, Moors, Malays, Veddahs, and a small proportion of Europeans and their descendants. The Singhalese inhabiting the coasts are a mild, timid race, obsequious to strangers, and hospitable and humane. Their stature is rather below the middle size; their limbs slender, but well shaped; eyes dark, finely-cut features, hair long, smooth, and black, turned up and fixed with a tortoise-shell comb on the top of the head; colour varying from brown to black, or rather from the lightest to the darkest tints of bronze. The Singhalese of the interior, or Kandian Singhalese, are a superior race, being stouter, handsomer, and of more manly and independent bearing, with a greater degree of intelligence. The Malabars of Ceylon are similar in all respects to those of the continent. The Mohammedans or Moors are an energetic and industrious people, and engross a large proportion of the commerce and traffic of the island. The Veddahs, a savage race, are supposed to be a portion of the aboriginal inhabitants of Ceylon. They inhabit the most secluded and inaccessible parts of the island, and subsist entirely on wild fruits and animals. A cloth round the loins is their only clothing; and their habitations, generally of small dimensions, are formed for security amongst the branches of large forest trees. They are a robust and hardy race, but extremely peaceable and inoffensive. The other inhabitants of the coast consist of Dutch, Portuguese, and English; some Malays or natives of the Eastern Archipelago, a few Chinese and Parsee traders, and a various population sprung from the intermixture of these races with each other. The descendants of the Dutch and other Europeans are known as *burghers*. The population is rapidly increasing. In 1832 it scarcely amounted to 1,000,000; whilst in 1881 it was 2,750,000. In 1891 the total was 3,008,239, including 2,000,000 Singhalese, 750,000 Malabars, 200,000 Moormen, and about 5000 Europeans. The increase is partly to be attributed to the number of coolies who come from India for employment on the plantations. Pop. (1901), 3,576,990.

Religion, Language, Public Education, &c.—More than half the population are said to be Buddhists, and about half a million are of the Hindu religion. Buddhism chiefly prevails in the interior, and generally among the Singhalese of the sea-coasts. It is maintained and protected by the British government, agreeably to the treaty of 1815. On the west and south-west coast numbers of the Singhalese profess the Roman Catholic religion. There are a number of Episcopal clergy in the island, subordinate to the Bishop of Colombo; various other Protestant bodies have places of worship, but the Protestants are less than half the number of the R. Catholics.

The Singhalese have a colloquial language peculiar to themselves, but their classic and sacred writings are either in Pali or Sanskrit. The Malabars use the Tamil. English is becoming more and more common, 'and there is scarcely a roadside village in Ceylon now where the traveller could not find some persons to speak English, or interpret for him.' The government has a department of public instruction, and good progress is being made in education throughout the island. On 1st Jan. 1891 there were 146,500 children participating in public instruction, a number of the schools being maintained or aided by government. There are schools maintained also by the Church Missionary Society, by the Wesleyan, the American, and the Baptist Missionary Societies, besides a number of private and some regimental schools.

Antiquities, History, &c.—The Singhalese annals contain a historical record of events for twenty-four centuries; and their authenticity, as regards descriptions of ancient towns and buildings, and other works of art, is established by existing ruins, proving that the island had been, at a remote period, inhabited by a powerful and numerous people. The ancient capital

Anuradhapura and its neighbourhood contain many interesting and splendid relics of the ancient Singhalese civilization. Chosen as the capital in B.C. 437, it received, fully a century later, various relics of Gautama Buddha, and to contain these as well as other sacred articles many temples were erected. In the first century of our era the city occupied an area of 256 square miles, inclosed by 64 miles of walls. A remnant of the celebrated bo-tree, said to have sprung from that under which Gautama sat at the time when he became a Buddha, is still seen inclosed in the court of a temple. Here, too, is the so-called Brazen Palace, originally built in B.C. 142, and consisting of 40 rows of 40 pillars each. Dagobas, or shrines containing relics of Buddha, are very numerous. They are of brick, incrusted with a special preparation which takes on a fine white polish. One of the finest of these monuments is the Ruwanwellisaye, built about B.C. 140; but the most beautiful of Ceylonese dagobas is the Toopharamaya, with many finely-sculptured columns. Jaitawanaramaya, originally 315 feet in height, is now 269 feet high, and, like most of the ruins of the island, is overgrown by trees and brushwood. Among the most curious and notable of the ancient relics which invest Anuradhapura with such profound interest are the numerous tanks constructed at various dates between B.C. 200 and A.D. 300, and in the twelfth century. Some of these are of enormous size, and several have been restored and applied to their original purpose of irrigation. From the eighth to the thirteenth century the capital was Pollanarrua, now Topare, near which also are found many splendid ruins, including a fine rock-temple. At Dambula there is a celebrated cave-temple, dating from the first century B.C.

Ceylon was known to the Greeks as *Taprobane*. In 543 B.C. it was conquered by Vijaya, a prince from the mainland of India, and for several centuries the island enjoyed great prosperity under the generally beneficent rule of his dynasty The Hindu incomers brought with them the civilization of their own country, and great part of Ceylon became covered with towns and villages. Several of Vijaya's successors had to contend with invading Malabars, and these ultimately secured the sovereignty. A restoration of the line of Vijaya in the eleventh and twelfth centuries contributed to the return of something of the ancient grandeur of the island. Little was known regarding it in Europe until 1505, when the Portuguese established a regular intercourse with Ceylon, being encouraged thereto by a native king. The Portuguese were subsequently expelled by the Dutch in 1658, after a stubborn struggle of twenty years' duration. The Dutch soon opened up an extensive and profitable trade with Holland, and they constructed several canals to serve as means of communication between their various posts on the island. Their policy, however, though beneficial on the whole to the Singhalese as well as themselves, was essentially a selfish and exclusive one. British intercourse with the island began in 1763, and in 1795, owing to the war with France and Holland, Britain was induced to attempt an effective occupation of it. In that year Trincomalee, and in the following year Colombo, was captured; and by these victories all the Dutch forts were transferred to Britain. By the Peace of Amiens (1802) the whole coast territory was formally ceded. The king of Kandy, who remained in possession of the central mountainous region, perpetrated such atrocities on his own people that many of their chiefs in 1815 entreated Britain to depose him. A short campaign was ended by the capture of the tyrant and his deportation as a prisoner to India, and since then the whole island has been under direct British rule. A serious rebellion in 1817 and minor ones in 1843 and 1848 have been the only breaks in the generally tranquil subsequent history of the colony. British rule has contributed very largely to the material advancement of the island by the construction of roads and railways, the extension of the Dutch canal system, the restoration of irrigation tanks, the bridging of rivers, and the development of its great natural resources. Two important events in its modern history have been the rise and decline of coffee-planting (say from 1837 onwards), and the substitution of tea-planting (from about 1878) in its place. The decline of coffee-planting, as is well known, has been caused by a leaf-fungus. The planting of cinchona, cacao, and rubber trees has also helped to add to the resources of Ceylon in recent times.

The principal towns of the island are Colombo, Trincomalee, Kandy, Galle, Jaffna, and Kornegalle, the capitals of the provinces in which they are respectively situated.

CEYLON MOSS. See AGAR-AGAR.

CHABASITE, or CHABAZITE, is a zeolitic mineral of tolerably wide distribution. It contains water, silica, alumina, lime, and sometimes potash or soda. It crystallizes in colourless transparent rhombohedra and in derived forms, and is soluble in hydrochloric acid. The mineral is found near Kilmalcolm, and in Skye and others of the Western Islands, at the Giant's Causeway, in Iceland, in France, and elsewhere.

CHABERT DE COGOLIN, JOSEPH BERNARD, MARQUIS OF, French geographer, was born at Toulon, Feb. 28, 1724, and entered the marines as a cadet in 1741. In 1750 he sailed to the North American coast, and on his return published the result of his observations in an astronomical and hydrographical work, entitled Voyage sur les Côtes de l'Amérique Septentrionale (Paris, 1753). In 1758 he was chosen a member of the Academy. In the American war Chabert distinguished himself so highly that in 1781 he was made commander of a squadron. In 1792 he was made vice-admiral. During the same year the revolution drove him to England, where he was received by Dr. Maskelyne. In 1800 he lost his sight in consequence of his intense application to study, and in 1802 returned to Paris, where Bonaparte assigned him a pension. In 1804 he was appointed a member of the Bureau des Longitudes, and in 1805 he presented to it a map of Greece and a description of the coasts of that country. He died December 1, 1805, of a pulmonary affection.

CHABLAIS, a district of France, in Savoy, south of the Lake of Geneva. Chablais at one time formed part of the Kingdom of Burgundy, but in the eleventh century came into the possession of the Counts of Savoy. In 1860 it was ceded to France, along with the rest of Savoy, by Victor Emmanuel, king of Sardinia. It now forms the arrondissement of Thonon (its ancient capital), in the department of Haute-Savoie.

CHABLIS, a town of France, department of Yonne, on the left bank of the Serein, 11 miles E. of Auxerre. It stands in the midst of vineyards, which produce the celebrated white wine known by its name. The annual product is about 200,000 hectolitres, or about 4,400,000 gallons, but the quantity sold over the world as Chablis is much greater. Pop. 2400.

CHABOT, FRANÇOIS, one of the wildest Jacobins of the French revolution, was born about 1757, and in early life entered the Capuchin order. The treatises of casuistry which he perused in order to prepare him for the confessional are said to have corrupted his morals, and on the suppression of the monasteries, though he still professed to be a priest, he gave himself up to the most scandalous excesses. The Bishop of Blois nominated him his vicar-general, and succeeded in getting him chosen deputy to the national convention for the department of Loire-et-Cher. In this capacity he displayed the bitterest animosity against the king and his ministers, and all deputies friendly to moderate courses; and laboured incessantly to overturn the throne. Most of the horrors of that sanguinary period are attributed to him. On the night of the 10th August, 1792, he preached in a church of the Faubourg St. Antoine, and urged the most violent incitements to insurrection; though on the following day he is said to have saved some priests and the Abbé Sicard, the celebrated teacher of the deaf and dumb, from the fury of the populace. His party, from occupying the higher seats of the national convention, were designated by the name of the Mountain, which they have since retained. The conversion of the cathedral of Nôtre Dame into the Temple of Reason is said to have originated with Chabot. He at last became suspected by his party, chiefly in consequence of his marriage with a young and beautiful Austrian, and the favouritism he displayed towards his two brothers-in-law, who were striving to enrich themselves in the general disorder. Along with several other deputies he was accused of having appropriated the effects of the former East India Company, and vainly tried to save himself by reminding Robespierre of the services he had rendered him. When he saw that he was lost he swallowed poison, but suffered such excruciating pains that he took an antidote to remove them. Three days after, on the 5th April, he was guillotined. His brothers-in-law shared his fate.

CHACABUCO, a mountain and mountain pass of Chili, 28 miles north of Santiago, in the province of that name. It is celebrated as the scene of a decisive victory of the Republicans over the Royalist troops on February 12, 1817.

CHÆRONEA, a town in Bœotia, famous as the scene of several celebrated battles of antiquity. An important battle was fought near it in B.C. 447, by which the Athenians lost the supremacy in Bœotia. A still more celebrated battle was fought B.C. 338, in which Philip of Macedon defeated the united forces of the Athenians and Bœotians, and crushed the liberties of Greece. A colossal sculptured lion was obtained by excavation on the site of this battle. In a third battle, fought at Chæronea, Sulla defeated the generals of Mithridates, B.C. 86.

CHAFF-CUTTER, an agricultural instrument for chopping hay or straw into half-inch lengths to be used as food for animals. The economical advantage of the chaff-cutter does not depend on rendering the chopped food more digestible; but on permitting it to be more thoroughly mixed with the more nutritive and palatable food, and preventing the animal from rejecting any part of it. By the use of the chaff-cutter animals are therefore induced to consume a much larger proportion of fodder with their food, which not only improves the condition of stock, but saves time in feeding, thus allowing the animal more time for repose, which contributes either to his fattening rapidly, or doing a larger proportion of work. A chaff-cutter consists of a long box to hold the material to be cut; an apparatus for conveying this material either by a continuous or intermittent process along the bed of the box; and an apparatus for cutting it off as it protrudes from the end.

CHAFFINCH (*Fringilla cœlebs*), a lively and handsome bird of the finch family, very common in Britain, where its haunts are chiefly gardens and shrubberies, hedgerows, plantations, &c. The male is 6 or 7 inches in length; the bill is bluish in colour, black at the tip; the forehead is black, the sides of the head dull pink, the crown, nape and sides of the neck fine bluish lead-colour; the chin, throat, and breast on its upper part dull pink with a tinge of rufous; back chestnut brown, with grayish yellow margins to the feathers; the greater wing-coverts are black at the base, broadly tipped with yellowish white, forming a conspicuous bar; some of the lesser wing-coverts are white, and others tipped with white, forming another bar; the first three quills are black with white on their margins, the rest with their bases and part of their inner webs white, and with pale yellow margins on half the outer webs; the tail is slightly forked; the two middle feathers are lead-colour, the next ones black, the outside one on each side having the whole or part of the outer web white. The female is rather smaller than the male, and altogether duller and less attractive in colouring. The food of the chaffinch consists of seeds and of insects and their larvæ. The latter are the favourite food of these birds, and they do good service in the destruction of them; it is mainly when the supply of these fails that they have recourse to seeds. They are also fond of the young and tender leaves of vegetables, such as newly-sprung corn, radishes, turnips, &c. The nest of the chaffinch has been universally remarked for its neatness and elegance. It is placed in various situations—sometimes in a fruit-tree in a garden, sometimes in a hedge, sometimes even in a furze bush. Its materials also vary, but they are generally similar in colour to the spot in which it is placed. The outside is usually covered with tree-moss and lichens, within it is lined with feathers, wool, or hair; and stalks of plants, grasses, roots, &c., are also frequently woven into it. So well is it compacted that considerable force is required to tear it to pieces. The eggs are four or five in number, of a dull bluish-green colour, clouded with dull red. They are irregularly streaked and spotted with dark, dull, well-defined red markings. Two broods are hatched in the year. The song of the chaffinch is lively and pleasant, though there is little variety in it. Its common call-note has also a cheerful sound. The specific name of *cœlebs* is bestowed on the chaffinch from the circumstance that the females separate from the males in autumn and remove to a different locality. Great flocks of the birds are seen at this season, some composed exclusively of males, others of females and perhaps also their young.

CHAGOS ARCHIPELAGO, a group of islands in the Indian Ocean, nearly on the same meridian as the Laccadives and Maldives, and probably a continuation of them. It extends from lat. 7° 39′ to 4° 44′ S., and lon. 70° 50′ to 72° 50′ E. The largest, called Diego Garcia or Great Chagos, 100 miles S. of the main group, is about 12½ miles long by 6 broad, is of a crescent shape, and consists of a coral atoll covered with cocoa palms, and inclosing a lagoon which forms a harbour 4 miles broad. Fish abound, and excellent green turtle visit the shores. The islands belong to Britain, and form a dependency of Mauritius. Cocoa-nut oil is the chief product. Pigs and poultry are reared in abundance. Pop. 750.

CHAGRES, a seaport of Colombia, on the N. coast of the Isthmus of Panama, at the mouth of a river of same name. It acquired some importance at one time as the station at which steamers landed the mails for the west coast of America, and has been frequently associated with proposed communications between the Atlantic and the Pacific. The terminus of the railway across the isthmus was, however, fixed at Aspinwall, about 8 miles N.E., and Chagres then greatly declined. The Panama canal route is partly in the bed of the Chagres river.

CHAILLOT, formerly a village of France, on the right bank of the Seine. It boasts a considerable antiquity, being noticed in a map of the eleventh century. In 1659 it became a suburb of Paris, and received the name of Faubourg de la Conférence, in memory of the conference at which the Peace of the Pyrenees was concluded. In 1786, when a wall of inclosure was built round Paris, it was included within it, and has since formed part of the western district of Paris, near the Champs Elysées.

CHAIN, in surveying, is a measure consisting of 100 links, equal to 4 rods, or 66 feet, used for measuring land. It is sometimes called Gunter's chain, from its inventor.

CHAIN. In nautical language chains are strong links or plaits of iron, the lower ends of which are bolted through a ship's side to the timbers. They are on the outside, and are used to contain the blocks called *dead-eyes*, by which the shrouds of the masts are fastened. Where a vessel has *channels* (that is *chain-wales*) the chains are held away from the bulwarks by them.

CHAIN-ARMOUR, coats and other pieces of mail, formed of hammered iron links, constituting a flexible garment which fitted to the person. It was lighter and less oppressive to the wearer than the heavy plates of steel of which the complete armour of the middle ages was composed, but did not afford such complete immunity, being liable to be penetrated by the thrust of a lance. Tunics formed of flat rings are found in plates of the eighth century, and these, together with leather, seem to have been the chief forms of defensive armour used in European warfare until they were partly superseded by the steel armour of the middle ages.

CHAIN-BRIDGE. See Bridge.

CHAIN-CABLE. See Cable.

CHAIN-SHOT, two cannon-balls, or two hollow hemispheres, connected together by a short piece of chain, formerly used in naval warfare. The balls when discharged tended to fly apart, and the missile had the effect of cutting or breaking objects that came in contact with the chain.

CHAIN-TIMBER, a timber of large dimensions placed in the middle of a building to give it strength.

CHAIN-WALES. See Channels.

CHAIR, an article of domestic furniture, consisting of a movable seat, with a back, for a single person. Among the Romans the word *sella* was used generically for seats of various kinds, and had usually a qualificative term appended to it, as *sella curulis*, *sella balnearis*. They had also specific names for different kinds of seats; a seat with a back, like our chairs, was called *cathedra*. Chairs were much less common both with the ancients and in the middle ages than they are in modern times; hence, perhaps, the reason why *chair* and *cathedra* have both given their names in an allegorical sense to various dignities. We speak of the *chair* of justice, and the *chairman* of a meeting, and *cathedra* is now most widely known by its derivative *cathedral*, the name still given to a metropolitan church.

CHAIR OF ST. PETER, at Rome, a relic of which the first known mention was made by Ennodius in 500, and a feast in honour of which was instituted or restored by Paul IV. in 1558. It was exposed for public veneration by Pius IX. in 1867 (Woodward and Cates' Enc. of Chronology).

CHALCEDON, a city of ancient Bithynia, opposite Byzantium, at the entrance of the Euxine, about 2 miles s. of the present site of Scutari. Chalcedon is said to have been founded before Byzantium, and when the founders of the latter city asked advice of Apollo he recommended them to build opposite the blind—that is, opposite those who had neglected the superior and selected an inferior site. Chalcedon was a flourishing town when it came into possession of the Romans, under the testament of Nicomedes, B.C. 74, as included in the Kingdom of Bithynia. It was finally destroyed by the Turks, by whom it was taken about 1075. At this place, in the autumn of 451, Marcian, the emperor of the East, held the fourth general council, for the purpose of destroying the ascendency of the Monophysite doctrines (see Monophysites), obtained in 449 by the influence of the Alexandrian patriarch Dioscuros at the (so called) *robber-synod* at Ephesus; and to establish a creed of Christian faith which, equally remote from the Nestorian and Monophysite doctrines, should satisfy all parties of orthodox Christians. The emperor's commissioners claimed the lead, but were preceded by the legates of the Roman bishop Leo I., who had endeavoured to establish articles of faith without the aid of a council, but deemed it judicious to maintain his influence there, and take revenge for the excommunication pronounced against him by Dioscuros. This council, which consisted of 600 bishops, mostly of the East, deposed Dioscuros, and after violent debates adopted into their articles of faith, at the instigation of the Roman legate, the tenor of a missive of Leo to Flavian, the former patriarch of Constantinople, directed against Eutyches, the founder of Monophysitism, besides the confessions of faith of the general councils of Nice and Constantinople; also two synodal missives of the former patriarch, Cyril of Alexandria, condemning the Nestorian tenets. The articles of faith settled by them declared the mother of Jesus the parent of God, and established, in opposition to the Monophysites, the belief of two natures in Christ, existing without mixture or change, without division or separation, so that by the union of the two natures in one person and substance their distinction is not destroyed, but the characteristics of each are retained. Besides this creed the council promulgated thirty canons against the abuses of the clergy, of which canons the twenty-eighth conceded to the Patriarch of Constantinople equal rights and privileges with the Roman, to whom it merely gave precedence of rank; and thus the matter remained, notwithstanding the remonstrances of the Roman legates. Bloody rebellions in Palestine and Egypt were the immediate consequences of the decrees of the council of Chalcedon against Dioscuros and the Monophysites; and not till after a long period of ecclesiastical contests, during which the Monophysites were entirely separated from the orthodox and formed a distinct church, did the Chalcedon formula of faith obtain the authority which it now has in the Catholic, Greek, and many Protestant Churches.

CHALCEDONY, a mineral identical in composition with quartz, but differing from it in always being uncrystallized, and existing either as botryoidal masses (resembling a bunch of grapes) or as veins, or in the hollows of rocks and minerals, into which it infiltrates, apparently in the soluble condition, and afterwards gelatinizes and solidifies. Several varieties go by different names in the arts.

1. The common chalcedony has a cloudy or milky appearance when held between the eye and the light. It is semi-transparent, or only translucent in various degrees. Though sometimes nearly white its more common colour is gray, more or less shaded with blue, yellow, brown, green, &c. The surface is often rough or uneven. Its fracture is usually even, though seldom smooth. It is usually contained in amygdaloid rocks, porphyry, greenstone, or basalt, or in the cavities of these rocks. It sometimes traverses them in veins. Sometimes it occurs in metallic veins, also in granite and gneiss. Oberstein, in the palatinate of the Rhine, is one of the best localities. Fine specimens are found in the islands of Faroe.

It is found also in Cornwall, and in many parts of the United States. It receives a good polish, and is much used for ring-stones, seals, &c.

2. Another of the principal varieties is carnelian. The prevailing colour of this variety is red; sometimes it has a tinge of yellow or brown, or is nearly white. Its colours, or their different shades, sometimes appear in spots or stripes, or gradually pass into each other. It is commonly semi-transparent, sometimes only translucent. Its geological situation is similar to that of common chalcedony, which it often accompanies. The finest specimens, sometimes called *oriental carnelian*, come from Cambay, Surat, &c., in India. It is obtained also from Arabia, Siberia, Sardinia, &c. It receives a good polish, and is much employed for seals, bracelets, &c. The ancients often engraved on carnelian.

3. Sard differs from carnelian in its colour only, which is reddish-yellow, or nearly orange, sometimes with a tinge of brown. It often appears blood-red by transmitted light. It is found at Deerfield, in Massachusetts, in greenstone.

4. Sardonyx consists of alternate layers of white chalcedony and of sard. It was highly valued by the ancients, and is still employed for cameos. It is found in India and in Perthshire.

CHALCHONDYLAS, Demetrius, a Greek grammarian, born at Athens about 1424, pupil of Theodore Gaza. On the taking of Constantinople by the Turks he came to Italy, where he taught the Greek language, was invited to Florence by Lorenzo di Medici about 1479, and proceeded afterwards on the invitation of Ludovico Sforza, to Milan, where he died in 1510 or 1511. He spread the study of the Greek language and literature in the west of Europe, and sent out several celebrated scholars. Among the works edited by him was Homer, in two vols. fol. (Florence, 1488); Isocrates, fol. (Milan, 1493); and Suidas, fol. (Milan, 1499). He also compiled a Greek Grammar, which was long in general use as a school-book. In his editions of the Greek authors he was somewhat arbitrary in his emendations of the text.—His brother Laonicus, after witnessing the fall of Constantinople, followed his brother to Italy. He is the author of a history of the last years of the Byzantine Empire, from 1297 to 1462.

CHALCIS, a town of Greece, in the island of Negropont or Eubœa, separated by the narrow strait of Euripus from the mainland, with which it is connected by a bridge that opens to let vessels through. The modern town is now one of the most attractive in Greece. Pop. (in 1896), 8661. Ancient Chalcis was one of the greatest of the Ionic cities, carried on a large trade, and planted numerous colonies. It gave its name to the peninsula of Chalcidice, in Thrace, in consequence of the numerous cities it founded there. It had also colonies on the coasts of Macedonia and Italy, in Sicily, and in the islands of the Ægean Sea. The government of Chalcis was, in the early period of its history, aristocratic. The Chalcians joined the Bœotians in a war with Athens, in which they were defeated, B.C. 506, and a large number of Athenians took possession of the lands of the wealthy Chalcians, who were called Hippobotæ, feeders of horses. After the Persian wars Chalcis became tributary to Athens. The Chalcians revolted B.C. 445, along with the Eubœans, but were vanquished by Pericles, who expelled the Hippobotæ from the city and altered the government. Another revolt occurred B.C. 411, and Chalcis for a short time became independent. A bridge was at this time built across the Euripus, and fortified; a passage sufficient for a single ship being left in the middle. The city was soon recovered by the Athenians, and continued under their sway until the Peloponnesian war put an end to the power of Athens. It was subsequently occupied by the Macedonians, and after various vicissitudes fell under the yoke of the Romans. Chalcis joined the Achæans in their last war with Rome, when the city was taken and destroyed by Mummius. It was afterwards rebuilt, and about the beginning of the Christian era was the chief city of Eubœa. It was held by the Venetians from 1210 to 1470, when it was taken by the Turks. The modern town consists of an inner walled town and an outer or suburban portion, the walls being the work of the Venetians. In the inner town the streets are narrow and the houses lofty. Several of the churches were formerly mosques.

CHALDÆA, in ancient geography, the southerly part of Babylonia, towards Arabia and the Persian Gulf, lying W. of the mouth of the Tigris and Euphrates. The Chaldæans are supposed to have been at first a wandering and predatory race like the Arabs, who afterwards became settled, and ultimately gave their name to Babylon and the Babylonian Empire. The name Chaldæan was especially applied to a portion of the Babylonian Magi, who were devoted to the pursuit of astronomy and magical science. See Babylonia.

CHALDÆAN CHRISTIANS. See Syrian Christians.

CHALDEE LANGUAGE, a form or dialect of the Aramean, one of the three principal varieties of the ancient Semitic (see Hebrew Language and Philology). The region called in Scripture *Aram* may be described generally as occupying the northern and north-eastern divisions of that corner of Asia which was the home of the Semitic languages. It was bounded on the N. by the Taurus range and the river Tigris, which latter also formed its eastern boundary; on the W. by the Mediterranean and Mount Lebanon; and on the S. by Palestine and the Arabian desert. The Aramean language was very extensively known, not only within the limits above mentioned, but beyond them. The princes of Judea and Assyria were familiar with it; it was spoken in the palace of Nebuchadnezzar, and even formed the medium of communication between the Persian court and its subjects in Judea and Samaria. It may also lay claim to a high antiquity, being probably the language of Abraham previous to his migration into Palestine, and certainly of his grand-nephew Laban. Unfortunately the older monuments of the language have perished, the Chaldee portions of Daniel and Ezra being the earliest specimens we possess of a language which had probably existed and flourished at least 2000 years before. There is another dialect of the Aramean besides the Chaldee, namely, the Syriac, and in this as well as in the Chaldee numerous writings are still extant, but they are all of comparatively recent date. The Chaldee literature is usually arranged in two divisions: the Biblical Chaldee, or those portions of the Old Testament which are written in Chaldee, namely, Daniel from ii. 4 to vii. 28; Ezra iv. 8 to vi. 18, and vii. 12–26; and Jeremiah x. 11; and the Chaldee of the Targums and other later Jewish writings. The former is distinguished by a closer approach to the Hebrew idiom, and is therefore considered less pure than the Chaldee of the Targum of Onkelos, the oldest and most valuable of the Targums.

CHALDER, an obsolete Scotch dry measure containing 16 bolls or 12 imperial quarters.

CHALDRON, an English measure of 36 bushels, used chiefly in measuring coal.

CHALEUR BAY, an extensive arm of the sea in the Gulf of St. Lawrence, between Quebec province on the N. and New Brunswick on the S., and about 85 miles long by 20 broad. The French fleet was here defeated by the British in 1760.

CHALICE (Latin, *calix*), a cup or bowl. This term, originally signifying a common drinking vessel, is now usually applied to a communion cup.

CHALK. See Lime.

CHALLENGE, to jurors, is an objection either to the whole panel or array, that is, the whole body of jurors returned, or to the *polls*, that is, to the jurors individually; and it is either *peremptory*, that is, without assigning any reason, or *for cause* assigned. A peremptory challenge is allowed to be made only by the party accused, and not by the government or prosecuting officer, and only in capital cases; and is said to be permitted on the ground that a man is liable to conceive a prejudice against another from his mere looks and appearance, for which he can give no reason: and such may be the case of the accused; and it is conceded in favour of life, that in such case he may exclude the juror without assigning any reason; and also on the ground that, by questioning a juror as to any objection to him, his prejudice may be thereby excited against the prisoner, who, to save himself from the effect of such prejudice, is permitted to have him rejected. The ground on which peremptory challenge is allowed supposes the prisoner's life to be in danger, and he is not entitled to it if he pleads in bar or abatement; for the trial of these pleas does not decide on his life. He must, before making such challenge, plead 'not guilty,' or some plea, the trial of which decides on his life. Having pleaded such a plea, the accused might, by the common law, peremptorily challenge thirty-five jurors; but the 22d of Henry VIII. cap. xiv. limited the number to twenty in felony. The regulating statute now in force is 6 Geo. IV. cap. l. By the law of the United States a peremptory challenge of thirty-five jurors is allowed in trials for treason, and twenty in those cases of felony mentioned in the statute. A challenge of the whole panel may be made because the jury is illegally drawn or summoned, whereby it is not a legal jury; and a challenge of this description may be made by the government as well as by the prisoner. Challenge to the polls may be made both in civil and criminal suits for cause, as that the juror is an alien, not from the proper district, not duly qualified as a freeholder, not of suitable age, &c., or is near akin to one of the parties, is biased, has been guilty of felony, is interested, or is subject to any other exception, according to the common principles of proceeding, or the provisions of any statute on the subject. In courts-martial a prisoner who objects to either of the judges must assign his reasons. In other words peremptory challenges are not allowed in these courts. The privilege of challenging here belongs equally to the prisoner and the prosecutor. The right of challenging the members of a court-martial prevails on the continent of Europe, as well as in England and America.

Challenge to fight a duel is punishable in England with fine and imprisonment. In several of the United States of America this offence is subject to the additional punishment of ineligibility to any public office, either for life or for a limited term. See Duel.

CHALMERS, Alexander, an English journalist, editor, and miscellaneous writer, was born at Aberdeen in 1759, and received a good classical and medical education in that city, where his father, the founder of the first Aberdeen newspaper, was a printer. About 1777 Chalmers came to London, and was employed as a contributor to the St. James' Chronicle, the Morning Chronicle, the Morning Herald, and various critical magazines and reviews. He edited numerous editions of the English classics, particularly the British Essayist, forty-five vols. 12mo, 1808, commencing with the Tatler, and ending with the Observer, together with prefaces, histories, and biographies; again published in 1808 and 1828; the Spectator, Tatler, and Guardian, twelve vols. 8vo, 1822; an edition of Shakspeare, with historical and explanatory notes, in 1809; republished 1812 and 1845; works of the English Poets from Chaucer to Cowper, with Johnson's Lives, and additional Lives by Chalmers, twenty-one vols. royal 8vo, 1810. The most important and valuable of Chalmers' extensive literary labours, however, was the General Biographical Dictionary, thirty-two vols. 8vo, 1812–17, the fullest body of biographical information published up to his time in this country, and which has rendered invaluable service to subsequent compilers. Chalmers was as much distinguished for painstaking accuracy as an editor, combining patient and intelligent investigation of facts with literary discrimination, as for the industry which enabled him to accomplish so large an amount of work. He died in London, 10th December, 1834.

CHALMERS, George, a Scottish antiquary and miscellaneous writer, was born in 1742, at Fochabers, in Elginshire. Having studied law at Edinburgh, he removed to America, where he practised that profession for upwards of ten years, till the colonies declared themselves independent. Mr. Chalmers being a keen loyalist, returned to Britain, where his sufferings recommended him to the government, and he was in 1786 appointed to the office of clerk to the Board of Trade. The duties of this office he continued to execute with diligence and ability for the remainder of his life, a period of thirty-nine years.

Previous to his appointment he had distinguished himself by various literary undertakings, particularly a work entitled Political Annals of the United Colonies, which appeared in 1780, in 4to, and manifested a profound knowledge of colonial history, law, and policy. He had also published, in 1782, an Estimate of the Comparative Strength of Great Britain during the Present and Four Preceding Reigns; and in 1784 Opinions on Interesting Subjects of Public Law and Commercial Policy, arising from American Independence; the former work in quarto, the latter in octavo. After his appointment he transferred his attention in a great measure from political science to literature. In 1790 he published his life of Daniel Defoe; in 1794 his life of Thomas Ruddiman (a very curious book); and in the course of the few subsequent years various pamphlets apologizing for those, himself included, who had believed in the authenticity of the Shakspeare manuscripts forged by Mr. Ireland. In 1800 he edited the works of Allan Ramsay, with an elaborate memoir of the poet; in 1805 the works of Sir James Stewart of Coltness, also with a life prefixed; and in 1806 the writings of Sir David Lindsay of the Mount, which were embellished in like manner. The first volume of his Caledonia, which appeared in 1807, in quarto, displayed a vast extent of erudition and research. It professes to be an account, historical and topographical, of North Britain, from the most ancient to the present times; and the original intention of the author was, that it should be completed in four volumes quarto, each containing nearly 1000 pages. Former historians had not presumed to inquire any further back into Scottish history than the reign of Canmore, describing all before that time as obscurity and fable. But Chalmers plunged fearlessly into the preceding ages, and was able, by dint of incredible research, to give a pretty clear account of the inhabitants of the northern part of the island since the Roman conquest. The historical part of his work, which occupies the first volume, is divided into periods analogous to the different races who predominated in the country: thus we have the Roman period, the Pictish period, the Scottish period (between the subjugation of the Picts and the intrusion of the Saxons under Malcolm Canmore), and the Scoto-Saxon period, which ends with the accession of Robert Bruce. The remaining three volumes were destined to contain a topographical and historical account of each county, and the second of these completed his task so far as the Lowlands were concerned, when death stepped in and arrested the busy pen of the antiquary, May 31, 1825. Chalmers left the remainder of his great work nearly ready for the press; and it has recently been published complete, with numerous annotations. He also wrote a Chronological Account of Commerce and Coinage in Great Britain, which appeared in 1810.

CHALMERS, Thomas, D.D., an eminent divine of the Scottish Church, was born on 17th March, 1780, in the burgh of Anstruther Easter, in Fife, where his father was a shipowner and general merchant. He was the sixth of a family of fourteen, and received his first education in the parish school of his native place. At the age of twelve he was sent to the University of St. Andrews, for the purpose of studying for the church, and after passing through a curriculum there of seven years, was licensed as a preacher in July, 1799, the rule of the Scottish Church requiring that a licenciate shall have reached the age of twenty-one being dispensed with in his case, in virtue of the exceptional clause in favour of those possessing 'rare and singular qualities.'

The first two winters after being licensed were spent by Chalmers in Edinburgh in studying mathematics and chemistry; and the post of assistant to the professor of mathematics at St. Andrews having become vacant, he applied for and obtained the situation. In May, 1803, he was presented to the parish of Kilmany, in the N.E. of Fife, and having been dismissed from factious motives from his place of assistant teacher of mathematics, he resolved to open classes of his own for teaching that science in the town of St. Andrews. These were so successful that he commenced a class of chemistry also, his lectures on and demonstrations in which created quite a sensation. About this time his views as to the obligations of a Christian pastor were very different from what he was subsequently led to entertain, and he deemed it a sufficient fulfilment of these to return to Kilmany on the Saturday evenings, and from thence back to St. Andrews on the Monday mornings, devoting the bulk of his time to scientific pursuits. In 1804 he was defeated in an application for the chair of natural philosophy at St. Andrews, and again in 1805 for the same chair in Edinburgh University. An objection made to his candidature for the latter chair, 'that the vigorous prosecution of mathematical or natural science was incompatible with clerical duties and habits' occasioned his first literary effort, entitled Observations on a Passage in Mr. Playfair's Letter to the Lord-provost of Edinburgh relative to the Mathematical Pretensions of the Scottish Clergy. In 1808 he published an Inquiry into the Extent and Stability of National Resources, the object of which was to show that the Berlin decree would not touch the real foundations of the prosperity of Britain.

In 1812 Mr. Chalmers married Miss Grace Pratt, second daughter of Captain Pratt, of the 1st Royal Veteran Battalion. The following year his article on Christianity appeared in the Edinburgh Encyclopædia, and shortly afterwards his review of Cuvier's Essay on the Theory of the Earth, in the Christian Instructor, a publication conducted by Dr. Andrew Thomson. In this last he propounded the interpretation of the first verses of Genesis, afterwards adopted by Dr. Buckland, with a view to make the truths of revelation and the discoveries of geological science harmonize. In his lectures at St. Andrews in 1803 he had already said, 'The writings of Moses do not fix the antiquity of the globe. If they fix anything at all, it is only the antiquity of the species.' His fame as a preacher had by this time extended itself throughout Scotland, and a vacancy having occurred in the Tron Church of Glasgow, he was elected to the charge by a large majority of the town-council, and inducted on 21st July, 1815. In the month of November following he commenced his series of astronomical discourses, in accordance with a custom observed in Glasgow, of the city ministers delivering in rotation a course of sermons in the Tron Church on Thursdays. The effect of these was perfectly electrifying, and created a sensation such as no sermons had ever before produced in Glasgow. It is related, that when the hour of delivering them arrived, merchants and men of business would regularly leave their desks and proceed to the Tron Church, while the more liberal among them would, in addition, grant a similar indulgence to their clerks and assistants. In the commencement of 1817 these discourses were published, and attained a sale of nearly 20,000 copies by the end of the year. They raised their author to the position of the first preacher of the day, and in a visit which he shortly afterwards paid to London, the most distinguished literati and statesmen crowded to listen to the wondrous oratory of the Scottish divine.

The main object which engaged Dr. Chalmers on his arrival in Glasgow, was the reorganizing of the parochial system, so as to provide a machinery by which the destitute and outcast might be visited and reclaimed, and the young instructed in the lessons and duties of religion. With this view he allocated to each of his elders the part which they should respectively bear in carrying out this new scheme, and succeeded in infusing into them the same ardent active spirit by which he himself was animated. Especial efforts were directed towards the establishment of Sabbath-schools, which in the course of two years had an attendance of 1200 children. Great exertions were also made by Dr. Chalmers to get new churches erected throughout Glasgow, the church accommodation for which comprehended scarcely a third of the inhabitants. In this he ultimately succeeded, and in addition, a new parish and church (St. John's) were erected and endowed expressly for himself by the town-council of Glasgow. To this he was in 1819 transferred from the Tron. The same zeal and activity which had there marked his pastoral career, were displayed in the conduct of his new parish. Besides numerous Sabbath-schools, two large week-day schools, in which all the primary branches of education were taught at a low rate, were established on behalf of the parishioners of St. John's. The fatigues, however, which such unremitting attention to parochial affairs involved were becoming too much for his health, and he had now so far adjusted matters in his parish, that the management of the machine might for the future be intrusted to others. On the vacant chair, therefore, of moral philosophy, in the University of St. Andrews, being offered to him, he accepted it, though, as might have been expected, a considerable disappointment was thereby produced in Glasgow. The date of his transfer to St. Andrews was November, 1823. As an instructor of youth, his affectionate concern for their welfare, independent of the mere intellectual attractions of his lectures, made him universally beloved by the students, many of whom he used to assemble at his house on Sunday evenings, for the purpose of religious conversation and instruction. In the town of St. Andrews, likewise, he laboured assiduously in visiting the humbler classes, and promoting their religious and moral improvement.

In 1827 the divinity chair in the University of Edinburgh became vacant, and Dr. Chalmers was unanimously elected to it by the town-council on 31st October. This appointment he held till the Disruption of the Scottish church in 1843. In 1832 he published his Political Economy, and shortly afterwards appeared his contribution to the celebrated Bridgewater Treatises (which see), a work On the Adaptation of External Nature to the Moral and Intellectual Constitution of Man. In 1834 he was elected a corresponding member of the Royal Institute of France; and the following year, while on a visit to Oxford, had the degree of D.C.L. conferred on him by its university. An important matter which now largely engaged his attention was the subject of church extension, which he had zealously advocated from the days of his ministry in Glasgow. But Lord Melbourne's government was little disposed to aid the Church of Scotland on this occasion, and it was consequently obliged to carry out its scheme on the voluntary principle. The results were satisfactory, and in 1838 Dr. Chalmers was enabled to state to the General Assembly that within the last four years there had been collected about £200,000, out of which nearly 200 new churches had been built.

Amid the various public movements with which Dr. Chalmers' name stands connected, there is none in which it more prominently occurs than in relation to the great non-intrusion movement in the Scottish church. (See FREE CHURCH.) Throughout the whole of this memorable contest, from the passing of the veto law by the General Assembly to the Disruption in 1843, he acted as the leader of the Evangelical party in their struggles with the civil power, and may be regarded as the founder of the Free Church, of the first assembly of which he was moderator. He was also the originator of the sustentation fund, out of which the ministers of that body are principally supported. Having vacated at the Disruption his professorial chair in the Edinburgh University, he was appointed, on the establishment of a new college in connection with the Free Church, to the offices of principal and primarius professor of divinity in that institution. Towards the end of 1844 he set on foot a scheme of active religious work among the inhabitants of the West Port district in Edinburgh, a locality notorious alike for physical squalor and moral degradation; and a new district church was opened here on 19th February, 1847. This movement was about the last public work in which Dr. Chalmers engaged. On 28th May of last-mentioned year he returned to his house at Morningside, near Edinburgh, from a journey to London on the subject of national education. On the following day (Saturday) he was busily employed in preparing a report to the General Assembly of the Free Church, then sitting. On Sunday, the 30th, he continued in his usual health and spirits, and retired to rest with the intention of rising at an early hour to finish his report. The next morning he did not make his appearance, and no answer being returned on knocking, his room was entered, and he was discovered lying tranquilly in bed quite dead. He had evidently passed away in a moment, without pain or even consciousness. He was interred in the Grange Cemetery, whither an immense assemblage of persons of all denominations accompanied his remains to the grave. The energy which made Chalmers remarkable as an orator was infused into all his practical undertakings; and in the social and religious movements which he inaugurated he has left his mark in the history of his country. His published works are very numerous, embracing sermons, tracts, essays, works on Political Economy, the Parochial System, Church Establishments, &c. They exhibit the same energy of conviction, together with a breadth and profundity of view, which, though many of his theories have not been accepted by other thinkers, will always make them a rich mine of suggestion and instruction to inquirers into the complicated relations of human society. Of his posthumous works, published by his son-in-law and biographer, Dr. Hanna, his Daily Scripture Readings and Sabbath Scripture Readings, the latter especially, are valued for their devotional feeling. See the Memoirs by Dr. Hanna, his son-in-law (1849–52, 4 vols.).

CHÂLON-SUR-SAÔNE (ancient *Cabillonum*), a town of France, in the department Saône-et-Loir, 33 miles north of Macon, at the commencement of the Canal du Centre, on the right bank of the Saône, here crossed by a bridge of five arches, communicating with the suburb of St. Laurent. It is irregularly built, and is surrounded by a wall and the remains of ancient fortifications. The public buildings include the church of St. Vincent, built in 1386–1440, a library with 22,000 volumes, a gallery of painting, &c. Châlon is the seat of a tribunal of first resort and of commerce, and has a communal college. There are foundries, dye-works, manufactories of leather, cloth, glass, &c., and a considerable trade in grain, flour, wines, &c. The Saône becomes navigable for steamboats here, and there is steamer connection with Lyons. Cæsar had grain magazines at Châlon, and it became the capital of Burgundy under Gontran. In 1273 Edward I. of England, being invited to a tournament here on his return from Palestine, attended with 1000 men-at-arms; and some disputes having arisen, the English attacked the French, killed a great number, and left the tilting-ground strewed with the dead. This event is known as 'the little war of Châlon'. The town suffered considerably from the civil wars of the fifteenth and sixteenth centuries, and from the invasion of the allies in 1814. It was formerly very unhealthy, but has been much improved in this respect by drainage. Pop. (1896), 23,962.

CHÂLONS-SUR-MARNE, or **CHAALONS** (ancient *Catalaunum*), a city of France, capital of the department Marne (Champagne), 94 miles east of Paris, with which it is connected by railway. It lies on the right bank of the Marne, which is here crossed by a handsome stone bridge of three arches, built in 1787. Low walls now supply the place of the old ramparts, the entrance being by six gates, which open to six main roads. The principal public buildings are the cathedral, a fine edifice, restored by Louis XIV. after having been destroyed by fire in the thirteenth century; the church of Notre Dame, of the twelfth and thirteenth centuries, and since restored; the Hotel de Ville, built in 1772; the Hotel de la Prefecture, built in 1764, one of the finest buildings of the kind in France; public library, containing 30,000 volumes; museum, hospital, poorhouse, &c. There is a fine promenade, occupying about eighteen acres, planted with superb elm-trees. Châlons is the seat of a bishopric, and of one of the schools of arts and trades, where 300 pupils are maintained and instructed at the public expense. There are manufactures of woollen and cotton goods; cotton mills, tanneries, &c. Châlons was fortified and embellished by the Romans. Christianity was preached here about the year 250. In 451 Attila was defeated before its walls. From the tenth century it formed a kind of independent state, governed by its bishops, till 1360, when it was united to the crown. Under its count-bishops it is said to have had 60,000 inhabitants. A celebrated camp was established by Napoleon III. at the distance of about

18 miles from Châlons for the purpose of training the French troops. In 1870 the town was occupied by the Germans after MacMahon's withdrawal. Pop. (1896), 20,434.

CHALYBEATE WATERS are those which contain salts of iron in sufficient quantity to give them a special value in the treatment of cases of anæmia, &c. Iron or steel waters are not the only mineral waters in which some form of iron is found. Indeed in nearly all this ingredient exists, but in very many in such small quantity, while other ingredients are so conspicuous, that the character of the water can hardly be supposed to be affected by that metal. There is no stated amount of iron which entitles a spring to be classed as chalybeate, though those most successfully resorted to contain from one-third to nine-tenths of a grain of iron, in the form of carbonate, in sixteen ounces. Some springs are classed as iron springs which contain barely one-fifth of a grain in sixteen ounces of water, but they are so because they have been found by actual experience to have the beneficial effects of iron waters. What are called *pure* iron springs are those which contain but a few grains of dissolved solids, a salt of iron existing to some appreciable amount; *compound* iron springs contain moderate quantities of other salts, such as Epsom and Glauber's salts, common salt, sulphate of lime, besides being rich in carbonic acid gas. The reason for the use of iron waters is that iron is a necessary ingredient of the blood, and in certain conditions promotes the formation of blood. Small doses only should be employed, as excess may irritate the stomach and bowels and produce constipation. It has been found that iron springs are most useful in cases of poverty of blood quickly produced, for example, by loss of blood by bleeding from the nose, or from wounds, by drain occurring from the blood owing to diarrhœa, suppuration, and other profuse discharges, in cases of chlorosis in young girls, and in poverty of blood dependent upon acute disease, in which cases they materially promote convalescence. Iron springs are also used in disorders of monthly illness, specially in its absence, in malarious conditions and poverty of blood due to residence in tropical countries, and in neuralgia, sterility, and impotency due to enfeebled conditions of general health. In such cases as these last the improvement is not so rapid, and is often best promoted by waters which, besides the iron, contain marked quantities of other ingredients like common salt. It is chiefly in the form of carbonate that the iron exists, and this is the best form for administration. The presence of carbonic acid gas in the water keeps the carbonate of iron in solution, and when the water stands, a yellowish rust is deposited. Iron springs are used for bathing, but it is not now believed that the iron produces any effect on the skin, or is absorbed from the bath. Among the chief chalybeate springs are two at Harrogate, called the Muspratt and the Tewitt, the latter pure; a pure one at Tunbridge Wells; one at Bocklet, near the salt spring of Kissingen, containing much common salt and carbonic acid gas; those of Antogast, Freiersbach, Griesbach, Petersthal, and Rippoldsau, in the Black Forest region, at altitudes of from 1280 to 1886 feet; one at Orrezza, in Corsica, with much carbon dioxide and traces of arsenic; many at Spa; one at St. Moritz, Switzerland, situated at an elevation of 5710 feet; one at Santa Catarina, Italy, 8 miles from Bormio, at a height of 5600 feet; several very popular pure ones at Schwalbach in Nassau; one at Pyrmont, Waldeck; and one at Cheltenham, with a very high proportion (·88 gr. in 16 ozs.) of iron carbonate.

CHALYBITE, sparry iron ore, the native carbonate, is one of the most important ores of iron. It occurs in rhomboidal crystals, also in botryoidal and globular forms, and occasionally in silky fibrous masses. It varies in colour from yellow to black, and may be transparent or not. It is somewhat magnetic. The fine crystals are found in veins traversing other rocks, but the mineral forms besides great rock masses or beds in different parts of Europe. In Britain it occurs pure, principally in the south-west of England; elsewhere it is generally mixed with clay and carbonaceous matter, and thus constitutes the clay-band and blackband ironstones.

CHAMÆROPS, a genus of palms established by Linnæus, and remarkable as containing those species of the palm family which are found at the greatest distance from the equator. It is characterized by its flabelliform leaves, polygamous and sometimes diœcious flowers, and its triple monospermous drupes. The *C. humilis* is the only palm which is seen growing in the open air in any part of Europe. It is confined, however, to its hottest parts, and even there is generally only from 4 to 5 feet in height. Its trunk, from 5 to 6 inches in diameter, is closely covered with triangular hard scales, the bases of the old leaves; the new leaves grow in a tuft at the top. Sometimes the stem does not appear at all; and the leaves, apparently issuing from the ground in the form of a large fan, have procured for the plant the name of the fan-palm. In hot-houses the stem attains the height of 15 feet or more. The leaves are used for thatch and other purposes, and they furnish a large quantity of fibre, which forms an article of commerce and yields a material that may be used instead of horse hair. *C. Fortunei*, a species from North China, stands the climate of southern England quite well. Brazilian grass is a fibre obtained from the *Chamærops argentea*.

CHAMALARI, CHAMALHARI, or CHUMALARI, one of the best-known though scarcely among the highest peaks of the Himálaya Mountains, at the western extremity of the boundary line between Bootan and Tibet. Its height is 23,944 feet.

CHAMBER, as a technical term, has various uses. In several languages *chamber* is used to designate a branch of government whose members assemble in a common apartment.—*Chamber of a cannon*, that part of the bore of a cannon which receives the powder with which it is charged.—*Chamber of a mine*, the place where the charge of powder is lodged that is to be used for blowing up the works. —*Chamber of commerce*, a board or association of persons who combine to promote the interests of the trade and merchandise of a city, the members being chosen from merchants, bankers, traders, &c. The oldest body of this kind is that of Marseilles, founded in the end of the seventeenth century, but the oldest British one, that of Glasgow, dates only from 1783. Edinburgh followed two years later, and for long held a leading position, but the most important British chamber of commerce at the present time is that of London, founded so lately as 1881. It has instituted a series of examinations in commercial subjects, and lectures are delivered under its auspices. Junior and senior commercial certificates are granted after examination to those who display the amount of knowledge required. In 1860 there was formed an Association of Chambers of Commerce of the United Kingdom, which holds annual meetings in London. It includes nearly 100 chambers.

CHAMBERLAIN, a court officer, originally employed, as the name indicates, either to take charge of the private apartments of a prince, or of a treasury, called in the tenth century *camera* (whence the word *chamber*). The golden key, which is worn by the chamberlains of the European courts on two small golden buttons (as well as the buttons themselves, when the key is omitted), indicates also the origin of the office. At present their employment (when their office is not merely nominal) is to attend on the persons of the princes and their consorts. There is generally a chief or high chamberlain. This officer in England is called *lord great chamberlain of England*. His office is one of great antiquity and honour, being ranked as the sixth great office of the English crown. He dresses and undresses the king before and after the coronation. There exists also a lord chamberlain of the household, a lord chamberlain of the queen's household, &c. In fact there are almost as many chamberlains as chambers.

CHAMBERS, EPHRAIM, a miscellaneous writer, and compiler of a popular Dictionary of Arts and Sciences. He was born at Kendal, in Westmoreland, and was educated there under the father of the celebrated Bishop Watson. On leaving school he was apprenticed to a mathematical instrument and globe maker in London. Here he acquired such a taste for the study of science, and made so much proficiency in it, that he not only formed the design of compiling his famous Cyclopædia, but actually wrote some of the articles for it behind his master's counter. The first edition of this work was published in 1728, in two vols. folio; and Chambers was soon after chosen F.R.S. Two subsequent editions, in 1738 and 1739, appeared previously to his death, which happened May 15, 1740, when he was probably about sixty years of age. Two other editions of the work came out subsequently to his death, the one in 1741, the other (the fifth) in 1746. A French translation of the Cyclopædia was the basis of the Encyclopédie of Diderot and D'Alembert. A revised and enlarged edition was brought out first by Mr. Scott and Dr. Hill, and afterwards, 1781–86 (in four vols. folio), by Dr. Rees, who latterly built up on it the work known by his own name. See REES (ABRAHAM).

CHAMBERS, ROBERT, LL.D., a historical and miscellaneous writer, and the younger of two brothers composing the eminent publishing firm of W. & R. Chambers, was born at Peebles in 1802, and died at St. Andrews, March 17, 1871, aged sixty-eight. His father, James Chambers, was a muslin weaver, and along with his brother William, who was his senior by two years, he received his education at the parish school of his native town and in the High School of Edinburgh. As a boy, he tells us, his hands were filled with 'books, not playthings;' and his family having experienced an unexpected reverse of fortune, he became at an early age a pupil in the school of self-reliance, where he received a training which proved of vast service to him in after life. At the age of sixteen he got together all the books belonging to his mother and himself, their value being about £2, and commenced business as a bookseller in Leith Walk. His elder brother William, after his term of apprenticeship was over, established himself in the neighbourhood as a printer. They united in projecting and issuing a periodical called the Kaleidoscope, Robert being editor and William printer, while both of them undertook the part of author, but the greater number of pieces came from Robert's pen. Their magazine, however, was a failure, and the last number was issued on the 29th December, 1821. Illustrations of the Author of Waverley, a kind of novel, took the popular taste, and was the means of bringing its young author into good society, and many persons of influence and discernment encouraged him to persevere. His next book, written when he was only twenty years of age, was the now well-known Traditions of Edinburgh (1823), the printing of which was entirely executed by his brother. The writing of this popular production was suggested to him during a ramble about the Old Town of Edinburgh with Sir Walter Scott. Various other works flowed from his pen in quick succession from this period till 1832:—Popular Rhymes of Scotland (1826); Pictures of Scotland (1827); Histories of the Scottish Rebellions; and a Life of James I. He next edited Scottish Ballads and Songs (three vols.); a Biographical Dictionary of Eminent Scotsmen (four vols.); and on the 4th of February, 1832, six weeks before the issuing of the Penny Magazine, the brothers commenced their periodical known as Chambers' Edinburgh Journal, which achieved an immense success. From this time W. & R. Chambers (at a later period their younger brother David was associated with them) united in the publishing business, and issued a series of works for the entertainment and instruction of 'the people,' 'free of any sectarian or political bias.' Robert Chambers contributed numerous essays, both pathetic and humorous, to the Journal, besides composing many educational works of a high class, including a History of the British Empire, a History of Scotland, and a Cyclopædia of English Literature. He also wrote The Domestic Annals of Scotland (three vols.); Ancient Sea-Margins; the famous Vestiges of Creation (not originally acknowledged as his); The Book of Days (two vols., 1864); and edited the Works of Robert Burns, with a narrative of the poet's life interwoven (four vols.). The toil and research required for The Book of Days shattered his nervous system, and closed his forty years of literary labour, during which he produced nearly 100 volumes. In 1863 the University of St. Andrews conferred upon him the degree of LL.D. Dr. Chambers was a Fellow of the Royal Society of Edinburgh, and of several other learned societies.

CHAMBERSBURG, a town, United States, Pennsylvania, capital of county Franklin, 32 miles s.w. of Harrisburg, finely situate in the valley of Conecocheague Creek, a tributary of the Potomac. The houses are mostly of brick or stone, and the general appearance of the town is very prepossessing. In the environs, which are fertile and well cultivated, blue limestone, freestone, and marble abound. Its trade is considerable, and has received an additional stimulus by the completion of the line of railway from Philadelphia to Pittsburg. Pop. (1890), 7863.

CHAMBÉRY, a town of France, capital of department Savoie, at the conflux of two small rivers near the Isère, between two mountains on the border of a fertile plain; pop. (1896), 15,596. It is an archbishop's see, and contains a cathedral, six hospitals, a castle, now the prefecture, the palace of justice, barracks, a covered market, a college, a museum, and a public library with 25,000 volumes. The old ramparts have been converted into public walks. In its vicinity are excellent baths, much frequented in summer. Its suburbs are large and elegant: all the houses have piazzas. It has considerable manufactures and distilleries; trade in grain, silk, cattle, &c. Chambéry was founded about the tenth century; was under feudal lords till 1230, when it was ceded to Thomas, first Count of Savoy, who built the castle, where the princes of the house of Savoy resided till the government was removed to Turin. The town was surrendered to the French in 1792, and became the capital of the department of Mont Blanc. It was restored in 1815, and ceded to France again in 1860.

CHAMBORD, a castle, park, and village, near Blois, department of Loir-et-Cher, in France. The splendid castle stands in the middle of a park, inclosed by walls extending 8 leagues. It contains 440 rooms, thirteen large staircases, and stalls for the reception of 1200 horses. It was built in the Gothic

style, by Primatice, for Francis I., and completed under Louis XIV. Here Francis I. indulged his inclination for gallantry; here the arts first sprang to life in France; and here King Stanislaus Leczinsky resided for nine years. In 1745 it was given by Louis XV. to Marshal Saxe, who died there in 1750. The Emperor Napoleon I. gave the domain of Chambord to Marshal Berthier. When the marshal's widow offered it for sale, a company of Legitimists bought it in 1821, and gave it to the Duke of Bordeaux, son of the Duke de Berry and grandson of Charles X. (See Bourbon). The Duke of Bordeaux was latterly known as the Comte de Chambord, and by the Legitimists was called Henry V.

CHAMBRE ARDENTE (*fiery chamber*).—1. An apartment hung with black and lighted with tapers, in which the corpse of a person of distinction is deposited before the funeral ceremonies.——2. The name formerly given in France to an apartment, also hung with black and lighted with tapers, in which sentence of death, frequently by burning, was pronounced on heinous offenders. The name was afterwards more especially given to those extraordinary tribunals which, from the time of Francis I., directed the persecutions against the Protestants, and acted as a sort of inquisition. The members of the tribunal were named by the pope. They ferretted out heretics by means of a system of espionage, directed the proceedings against them, pronounced sentence, and also saw it carried into execution. A *chambre ardente* was established by Louis XIV. to put a stop to the numerous cases of poisoning which, after the proceedings against the Marchioness of Brinvilliers, were brought before the public. Many persons of the highest rank, among others the Marshal of Luxemburg and Princess Louise of Savoy, were brought before this court, which, however, existed only for two years, and ceased in 1680. The last exercise of its powers was the condemnation of the celebrated sorceress Voisin.

CHAMELEON (*Chamæleo*, Daud.), a genus of reptiles belonging to the Saurian or lizard-like order, a native of parts of Asia and Africa. The very remarkable power which these animals possess of changing their colour, and at pleasure producing a succession of rich and beautifully varied tints over the whole body, at a very early period called the attention of observers to their habits. Aristotle has left a very perfect description of the chameleon in the eleventh chapter of his second book on the history of animals. Various poets and fabulists have at different periods contributed to its celebrity, and by inaccurate or fanciful representations have rendered it far more of a prodigy than nature ever designed it to be.

The skin of the chameleon is composed of a sort of small, scaly grains, and under ordinary circumstances is of a greenish-gray colour. The general form of the body reminds one of the lizard, but the trunk is compressed, and the back highly ridged or cutting. The occiput, or posterior part of the head, is elevated pyramidally; the eyes are large, projecting far outwards, yet almost entirely covered over by the skin, except immediately opposite the pupil. What is still more singular, the eyes are capable of moving independently of each other, taking different directions at the same moment. There is no visible external ear; the tongue is fleshy, cylindrical, and capable of great elongation; the teeth are trilobate. The first ribs unite with the sternum, the succeeding with their correspondents of the opposite side, inclosing the abdomen in a perfect circle. Each of the feet has five toes, but these are separated into two groups (one containing two and the other three toes) by the skin, which covers them entirely to the nails. The tail is long, round, and prehensile, or capable of grasping twigs or branches to sustain the animal. The lungs of the chameleon are vesicular, and so large that, when inflated to the utmost, the whole body becomes almost transparent. With the different degrees of inflation the surface undergoes changes of colour, owing to the changes of dimension and shape in the pigment cells, which are distributed in two layers beneath the skin, the upper containing yellowish, the deeper containing black or dark brown pigment. It is scarcely possible to witness anything more curious or beautiful than the rapid transitions from hue to hue exhibited by the chameleon when aroused to motion. The chameleons are all exceedingly slow, dull, and almost torpid. The only part which they move with celerity is the tongue, which, when extended, is as long as the body. This organ is clothed at its extremity with a viscid, gluey mucus, and is darted out for the purpose of capturing insects, upon which the animal subsists. As they feed but seldom, and are frequently seen inhaling the air, to inflate their bodies as above mentioned, ancient observers concluded that they fed altogether on air; but closer attention to their habits has shown that they require a diet rather more substantial. Several species are known, and are natives of Africa, Madagascar, Southern Asia, and the Molucca Islands. They pass their lives altogether upon trees, feeding upon small insects, for which their construction shows them to be perfectly adapted.

CHAMELEON MINERAL is the name given to manganate of potassium, because a solution of it changes from green, through a succession of colours, to a rich purple. See Manganese.

CHAMFORT, Sebastien-Roch Nicolas, a literary man, chiefly distinguished for the part he took in the French revolution, was born in 1741, near Clermont in Auvergne, died in 1794. The only parent whom he knew was his mother, who obtained for him a bursary at the College des Grassins, at Paris, where he studied with eminent success. He made his debut as a litterateur under the name of Chamfort, and obtained some success as a dramatist and as a critic, which procured him a place in the French Academy, a pension, and a place at court. An independent and somewhat misanthropic spirit made him, however, in spite of his interest, favour the revolution, of which he became the epigrammatist. He resigned his employment at court, and took the literary editorship of the Mercury. He furnished Sièyes with the idea and the title of his famous pamphlet Qu'est-ce que le Tiers-État? and forged such popular watch-words as 'Guerre aux châteaux, paix aux chaumières' (War to the castles, peace to the cottages). He was employed by Roland in the National Library, and published the first twenty-six Tableaux Historiques de la Révolution. He found the arm of ridicule too feeble against the reign of terror, which he combated with the *mot*, 'Sois mon frère, ou je te tue' (Be my brother, or I shall kill you). Threatened with imprisonment, he endeavoured to blow out his brains. Though not immediately fatal, the wounds he inflicted on himself ultimately put a period to his life. His works have been twice published, by Ginguené, 1795, four vols. 8vo, and by Auguis, five vols. 8vo, in 1824. His poetry has now little reputation. His best work, Mustapha and Zeangir, at which he laboured for fifteen years, exhibits him as a feeble follower of Racine and Voltaire. It is praised for purity of style and mildness of sentiment; but, as a French critic pungently observes, he reserved all his mildness for his tragedies. A collection of 1800 *bon mots*, under the title Chamfortiana, is now considered the best memorial of him. In this he appears as a man to make himself feared rather than loved.

CHAMIER, FREDERICK, a popular writer of fiction, was born in London in 1796, entered the navy at an early age, took part in the last campaigns against the French, and distinguished himself in the American war of 1812. He retired in 1833 with the rank of captain, and living at Waltham Hill, acted as a justice of the peace for the counties of Hertford and Essex. He died in 1870. He imitated Captain Marryat in making his experience of a sea life the basis of a series of romantic tales. He did not equal Marryat in humour and imagination. He has, however, been credited with great fidelity to nature. Allan Cunningham says of his naval sketches that they are 'truths slightly touched with the fingers of fiction.' His principal works are, The Life of a Sailor (1834); Ben Brace (1835); The Arethusa (1836); Jack Adams (1838); Tom Bowline (1839). He also published a review of the scenes witnessed by him in the revolution of 1848.

CHAMISSO, ADELBERT DE (properly Louis Charles Adelaide de Chamisso de Boncourt), was born at the castle of Boncourt, in Champagne, in 1781. When a mere boy his family were driven by the breaking out of the revolution to seek an asylum in Berlin. Here, from 1796 to 1798, he was page to the queen-mother, and afterwards entered the Prussian service, where he remained till 1808. On the Peace of Tilsit he returned with his family to France, and in 1810 was appointed professor in the Lyceum of Napoleonsville; but shortly after returned to Prussia, and during three years devoted himself enthusiastically to the study of natural science at Berlin. Count Romanzoff having in 1815 fitted out a vessel, under the command of Otto von Kotzebue, for the discovery of the north-west passage, Chamisso accepted the appointment of naturalist to the expedition, and added greatly to his store of scientific knowledge. His captain's treatment of him, however, was by no means courteous; and when the account of the expedition was published he had the mortification of seeing his labours represented as abortive and incorrect. He afterwards took up his residence at Berlin, was appointed superintendent of the botanic garden, and received the diploma of doctor from the university, for the collections in natural history which he had presented to the museum. He died at Berlin in 1838. His abilities as a naturalist are displayed in his work De Animalibus quibusdam e Classe Vermium Linnæi (Berlin, 1819), and his View of the Most Useful and the Most Noxious Plants of North Germany, with Remarks on Scientific Botany. In 1827, partly for the purpose of rebutting the charges brought against him by Kotzebue, he published Views and Remarks on a Voyage of Discovery, and Description of a Voyage round the World. Both works display great accuracy and industry. His last scientific labour was a tract on the Language of Owyhee. His reputation as a naturalist has been somewhat eclipsed by that which he acquired as a poet. As early as 1804–6 he, in concert with Varnhagen von Ense, published a collection of poems, under the name of the Muses' Almanac; and in 1813 appeared his celebrated and most original tale, Peter Schlemihl, which has been translated, among other languages, into English, and admirably illustrated by Cruikshank. His poetry is marked by vigour, correctness, and a thorough command of the German language; but is in general of a gloomy and terrific cast, a turn of mind probably fostered by the misfortunes of his early youth. He is the author, however, of several humorous pieces; and his political poems are distinguished by caustic, yet wholesome raillery. Many of his ballads and songs are masterpieces of their kind. He translated a selection of Beranger's songs into German. His collected works, with a biography and correspondence, were published by Hitzig, in six vols. (Leipzig, 1836–39).

CHAMOIS (*Antilope rupicapra*, Pall.), a well-known species of the genus antelope (which see), found only in high, mountainous regions, where they feed in small flocks or families, on the highest cliffs affording vegetation, which are almost inaccessible to man. The chamois are exceedingly shy, and have very acute senses, so that it is only by great patience and skill that the hunter can come sufficiently near to shoot them. They are so swift, and leap with so much vigour, and with such sureness of foot, as to render it impossible to overtake them in a fair chase.

Hence the hunters of the Alps, where a few of this species are still found, are obliged to encounter the greatest perils in pursuit of this favourite game, and owing to the occurrence of sudden fogs, storms, avalanches, and various accidents, may always be regarded as placing their lives in great jeopardy. Chamois are found among the mountains of the Caucasian range, and among the heights of the Himalaya, in greater abundance than in the Alps and Pyrenees, where they are so closely pursued. Their flesh is considered a very superior article of food; but whether it is in fact much better than that of other animals of the antelope or deer kind, may reasonably be doubted. The skin of the chamois is wrought into a soft pliable leather, well known by the name of *shammoy* or *shammy* leather. During the winter the chamois keeps in the caverns and hollows of the rocks. Its voice is a short, sharp whistling. Two and sometimes three young are produced at a birth. (See plate at UNGULATA.)

The chamois is about 3 feet in length, and 2 feet high; its head resembles that of the domestic goat, but the nostrils are less, and the upper lip not so prominent. It has no muzzle nor beard. The horns are 6 or 7 inches long, round, almost smooth, at first straight and perpendicular, and suddenly terminating in a hook directed backwards and slightly downwards. There is no tear-pit, nor are there cutaneous appendages or glands in front of the lower part of the neck. The skin is clothed with two sorts of hair —a very abundant and brownish woolly, and a dry and frangible silky hair, varying with the seasons, upon the body exclusively, of a rather deep-brown in winter, of a brown fawn colour in summer, and slightly gray in the spring. Both sorts of hair are gray at the base throughout the year. The head is of a pale yellow colour, excepting a black-brown band, which commences near the nose, and ends at the base of the horns and ears, after surrounding the eyes. The tail is black. The inside of the thighs and the ears are white. The hoofs are concave beneath, and terminate by a projecting edge, especially on the outside. The female closely resembles the male, except that she is much smaller. The kids are of a deep yellowish colour, having the under jaw, both sides of the head, and the throat white. There is a black band beginning at the corner of the mouth on each cheek, surrounding the eye, and ending on the forehead, without meeting the band of the other side; end of the tail black; thighs white; a dorsal line, crossed by a transverse one, upon the shoulders.

CHAMOMILE. See CAMOMILE.

CHAMOND (ST.), a town of France, department Loire, 6 miles N.E. St. Étienne, at the confluence of the Gier and Janon, and on the railway from St. Étienne to Lyons. It is well built, has a handsome parish church, a promenade, public baths, communal college, and a consulting chamber of manufactures. The old castle on the side of a steep hill, and now in a ruinous condition, presented the singularity of a belfrey below a church, and a church below a meadow, round which a carriage could be driven. A hill in the vicinity furnishes excellent building stone from its summit, while the base is a mass of coal, in which extensive mines are worked. This is a thriving manufacturing town, carrying on three special branches of industry, namely, milling silk, the manufacture of nails of all kinds, and the fabrication of braid and similar articles. There are also dye-works, bleaching grounds, foundries, forges, steel-works, and furnaces, and various other industrial establishments here or in the neighbourhood. There are the remains of an aqueduct, which conveyed the waters of the Janon to Lyons. Pop. (1896), 14,427.

CHAMONIX, or CHAMOUNI, a celebrated valley of France, in the department of Haute-Savoie, district Faucigny, in the Pennine Alps, fully 3000 feet above sea-level. It is about 12 miles long, and only about half a mile wide; lies S.W. to N.E., its E. side formed by Mont Blanc and other lofty mountains of the same range, and its W. by Mont Brévent and the Aiguilles Rouges. It is traversed in its whole extent by the Arve, which leaves the valley by a narrow gorge at the S.W. end, through which also passes, high above the river, the highway to Sallanches and Geneva. At its N. end the valley communicates with Canton Valais by two roads and a bridle-path, the latter crossing the Col de Balme; and it may also be left by other passes, as the Col du Géant, but they are difficult and dangerous, and only suited for practised and daring pedestrians. The mountains on the W. side of the valley, though attaining a height of 8500 feet above sea-level, are not covered with snow in summer; but those on the E. side, in the range of Mont Blanc, being from 10,000 to upwards of 15,000 feet high, are always snow-clad, excepting where the peaks are too perpendicular for snow to lie. From the snowy range alone, of course, proceed those remarkable features of the valley, the glaciers, some of which approach close to the cultivated fields. They are very numerous, and of different sizes; but the two most important are the Glacier des Bossons and the Mer-de-glace, the latter one of the largest glaciers in the Alps. From its lower extremity, called the Glacier des Bois, the meltings of the glacier flow off, in greater or less volume according to the season of the year, from under a naturally-formed ice-arch, the source of the Arveyron, the name given to the stream thus formed, which is an affluent of the Arve. The lower slopes of the mountains are covered with timber, through which is frequently to be seen the devastating course taken by the avalanche. The soil is not fertile, but it is assiduously cultivated; and the inhabitants, who are gathered together in numerous villages, of which Chamonix or Le Prieuré is the chief, raise barley, oats, spelt, flax, potatoes, &c., rear cattle, and keep bees, from which most excellent honey is obtained, and a considerable quantity exported. During the winter, yarns, cloths, hats, and implements are made, and many fanciful articles of wood are carved. All the valley is famous for its scenery, which was first brought under public notice by Windham and Pococke, two Englishmen who visited it in 1741. It presents various points from which the whole mass of Mont Blanc may be seen at one view. Pop. 5000. The village of Chamonix, 39 miles E.S.E. of Geneva, originated in a Benedictine priory founded about 1090. It has several hotels, and is supported mainly by visitors to the scenery of the valley. The ascent of Mont Blanc is most commonly made from this village. There is a monument to De Saussure, who did much to bring the valley before the notice of travellers. Pop. 2435.

CHAMPAGNE, an ancient province of France, which before the revolution formed one of the twelve great military governments of the kingdom. The name Champagne, formerly Champaigne, is derived from the vast plains (Latin, *campus*, a plain) which occupy the territory. Champagne was bounded on the N. by Hainaut and the bishopric of Liége; on the E. by the duchy of Luxembourg and Lorraine; on the S. by Franche-Comté and Burgundy; and on the W. by L'Orléanais, L'Isle de France, and Picardie. It forms at present the departments of the Marne, Haute Marne, Aube, Ardennes, and part of those of the Yonne, the Aisne, Seine-et-Marne, and Meuse. The land is fertile, and produces the celebrated wine called after its name; also much grain and pasturage. Troyes was the capital. See next article.

CHAMPAGNE is a French wine which is made chiefly in the department of the Marne, in the former province of Champagne. It is commonly divided into river and mountain wines (*vins de la rivière de Marne*, and *vins de la montagne de Rheims*), the former being for the most part white, the latter red. Not all of these wines are sparkling or frothing, though by the name *champagne* is generally understood such wine as has been subjected to an imperfect fermentation, and contains a quantity of carbonic acid gas, generated during the insensible fermentation in the bottle, this gas being disengaged on removing the pressure by which it was detained in solution. The briskest wines are not always the best; they are, of course, the most defective in true vinous quality, and the small portion of alcohol which they contain immediately escapes from the froth as it rises on the surface, carrying with it the aroma, and leaving the liquor that remains in the glass nearly vapid. Hence the still or the creaming or slightly sparkling Champagne wines (*vins crémants* or *demi-mousseux*) are more highly valued by connoisseurs, and fetch greater prices than the full-frothing wines (*vins grand-mousseux*). By icing these wines before they are used the tendency to effervesce is in some degree repressed; but when they are kept cool this precaution is unnecessary. In general, it may be observed that the vineyards on the banks of the Marne supply the choicest wines, and that the quality degenerates in proportion as they recede from the river. Among the white wines of Champagne, the first rank is generally assigned to those of Sillery, the produce of the vineyards of Verzenay, Mailli, Raumont, &c. Of the Rheims mountain wines those of Verzi, Verzenay, Mailli, Bouzy, and St. Basle are most esteemed; but the Clos St. Thierry furnishes perhaps the finest red champagne. The soil of the principal vineyards throughout Champagne is composed of a loose marl, resting on chalk, and sometimes mixed with flints. For the manufacture of the white champagne wines black grapes are now generally used. In making the red wines the grapes are trodden before they are introduced into the vat. Champagne, when well made, and placed in cool cellars, will retain its good qualities from ten to twenty years.

CHAMPAK (*Michelia champaca*), an East Indian tree of the natural order Magnoliaceæ. It has large axillary flowers of a deep yellow colour, and very fragrant. The tree is sacred to Krishna, and the women of India adorn their hair with its blossoms. The bark has tonic properties.

CHAMPARTY, or CHAMPERTY (Latin, *campi partitio*, a division of lands), in law, is a bargain with the plaintiff or defendant in any suit to have part of the land, debt, or other thing sued for, if the party that undertakes the suit prevails therein, the champertor carrying on the party's suit at his own expense. It is a species of maintenance, and is held to be illegal both in courts of common law and equity. See MAINTENANCE.

CHAMP CLOS (French, a closed-in field or area), formerly a place set apart for combats between those who wished to determine, in that manner, either a lawsuit or dispute of honour. This name was also given to the place set apart for tournaments.

CHAMP-DE-MARS and CHAMP-DE-MAI. The *Campus Martius* was a large field on the Tiber, in ancient Rome, near the modern Ponte Molle. After the expulsion of the last king, who was the owner, it was consecrated to Mars, and served the Roman youth for a place of military exercise. The people used to assemble there for the election of magistrates, and the place was adorned with splendid buildings and rows of pillars. At a short distance appeared the tomb of Augustus and the Pantheon, now the *Maria Rotunda.* When the Franks had conquered the Gauls in 486 they held their public assemblies, according to the German custom, in the open air. In the fifth and succeeding centuries these assemblies were called, from the time of meeting, Champs-de-Mars. In the eighth century they were transferred by Pepin, the father of Charlemagne, to the month of May, and called the *Champs-de-Mai;* but the plain where the Frankish kings annually reviewed the army had the name of the Champ-de-Mars, or the *Campus Martius.* At the Champs-de-Mai the king was present with the members of his court, the bishops, the nobles, and the people. The latter, however, long neglected the privilege of attendance, and were at length deprived of it. All questions relating to public affairs, such as war, peace, the enactment of laws, were decided by the majority. These assemblies were held irregularly under the Merovingians, but became more frequent and systematic under the first Carlovingians. Pepin called together only the nobility and the clergy; but Charlemagne ordered that every count should bring with him thirteen assessors, or the same number of the most respectable men within his jurisdiction, to represent the people in the general assembly. The first descendants of Capet departed from this usage; but Philip IV., who reigned from 1285 to 1314, restored the third estate by calling together delegates from the cities.

The modern Champ-de-Mars in Paris is an extensive area, which originally formed a place of exercise for the young men in the military school (École Militaire), and subsequently has been the scene of various public festivals and great gatherings of people. It was also the site of the international expositions of 1867, 1878, and 1889. Louis XVI. and his family took part here, in 1790, in the great *fête de la fédération,* in which the king swore to defend the new constitution, so soon to be succeeded by scenes of tumult and bloodshed. A second fédération was held here in 1792, but distrust and disunion had already begun to take the place of enthusiasm. In 1815 Napoleon selected the Champ-de-Mars for the scene of a general assembly of the French people with deputies. He determined, after his return from Elba, to lay before the representatives of the nation the articles of a supplementary constitution, called the *Acte additionnel,* which he had drawn up in the form of the Frankish capitularies, and thus, by an imposing show, to establish the legality of his second accession to the throne. This meeting was held June 1, 1815. After a solemn mass, Dubois, one of the 500 deputies from the central committees of the electoral colleges, read an address expressive of the allegiance of the French people to the government of Napoleon. The high chancellor then made known the assent of the people to the proposed supplement to the constitution. Although no deputies appeared from forty of the departments, the herald announced that the *Acte* was accepted by the French nation. Accordingly Napoleon signed it, and declared in a speech before the assembly that he enjoyed his distinction as an emperor, a consul, a soldier, in fine, that he received everything from the people. He then swore to observe the fundamental laws of the empire, and to enforce their observance. The whole assembly, consisting of about 20,000 persons, repeated the oath. Then a Te Deum was chanted, and Napoleon distributed the eagles to the national guards, and the sea and land forces, who were drawn up around him in the form of squadrons and battalions. Inclusive of 27,000 national guards, the whole number amounted to 50,000 men. After this festival, which partook of a political, religious, and military character, Napoleon assembled the chamber of peers, and of the deputies of the people. Three weeks after the commencement of the session the chamber received the abdication of the emperor.

CHAMPEAUX, Guillaume de, a scholastic philosopher, so called from the village of Champeaux in Brie, near Melun, where he was born about the middle of the eleventh century. He died in 1121. He studied at Paris under Anselme, De Laon, and Manégolde, and afterwards himself opened a school there, in which he had numerous pupils. The schools opened by De Laon and Champeaux are regarded by Pasquier as the origin of the University of Paris. Among the pupils of Champeaux were Robert de Bethune, one of the most distinguished prelates of the age, and the still more famous Abelard. He defended the doctrine of realism against the nominalism of Abelard; but it is only in the works of Abelard that any record of their contention remains. Champeaux has left a treatise on the origin of the soul, De Origine Animæ, in which he examines the question how children dying without baptism are justly damned, which he concludes by referring to the unfathomable judgments of God. The only other work of his which has been printed is Moralia Abbreviata. He founded in 1113 the abbey of St. Victor.

CHAMPION. In the rudest state of society men revenge their own wrongs without restraint. The first step commonly made towards a better state of things in the rude beginnings of political society is to confine this right within certain bounds, and allow it to be exercised only with certain formalities. This was done by the feudal institutions of Europe, which recognized in many circumstances, under the sanction of the church itself, the right of private combat. In some countries, however, particularly in England, the legal recognition of the right of combat had this injurious effect, that the practice became so settled as to be allowed to continue, even after more rational ideas had grown up on the subject of the administration of justice. The combat, after it had become a common means of settling disputes, was not always waged by the contending parties. This was the case, indeed, in appeals of felony, and if the heir, either from sex or age, was incapable of *waging his battle,* as it was called, the question was left to a more rational mode of settlement. But in the writ of right, the last and most solemn decision respecting real property, the tenant was required to produce his champion, who threw down his glove as a challenge to the champion of the demandant, and the latter, by taking it up, accepted the challenge. The laws authorizing judicial combat, though fallen into disuse, continued to disgrace the English statute-book till 1819 (see Appeal). Even the right to the English crown was in some degree put in issue by appeal to judicial combat; and the appearance of a champion offering battle to any one who gainsays the right of the king to the crown was till recently a part of the ceremonial of an English coronation.

CHAMPLAIN, Lake of, a lake of considerable extent, chiefly in the United States, between the states of New York and Vermont, but having the north end of it within the Canadian boundary, in the province of Quebec; extreme length, north to south, about 125 miles; breadth, from half a mile to 15 miles; area, about 600 square miles; 90 feet above the level of the sea. It was discovered in 1609 by Samuel Champlain, governor of Canada (see next article), whence its name; it is navigated by steamboats and other vessels, and is deep enough for ships of the largest class. Its waters are carried northwards to the St. Lawrence by the river Richelieu or Sorel, which, in conjunction with the Chambly Canal, affords navigation for large vessels, and forms a well-frequented line of communication. The south end of the lake is connected by a canal with the Hudson River, lake Champlain thus affording water communication between the St. Lawrence a few miles below Montreal and the Atlantic at New York. Upwards of fifty islands are scattered over its surface; and it receives numerous streams, none of which are very important. The scenery along its sides is picturesque. It abounds in salmon, shad, pike, and other fish; in winter it is usually quite frozen over, and is passable on the ice. The chief port on its banks is Burlington.

CHAMPLAIN, Samuel, a French naval officer and maritime explorer, was born at Brouage about 1570; died in 1635. His exploits in the maritime war against Spain in 1595 attracted the attention of Henry IV., who commissioned him in 1603 to found establishments in North America. He sailed from Honfleur, and ascended the St. Lawrence to the point where Cartier had stopped in 1535. In a second expedition (1604–7) he visited the coasts of Acadia (Nova Scotia). In a third voyage (1608) he founded the town of Quebec, and explored Lakes Ontario and Champlain, to the latter of which he gave his name. In 1620 he was appointed governor of Canada, with the title of lieutenant-general to Marshal Montmorency, who was named Vice-admiral of New France. He treated the natives with benevolence, and endeavoured to civilize them. He was compelled to surrender Quebec, which he had fortified, to the English in 1627, when he returned to France, but recovered his command at the peace in 1629. The best edition of the Voyages de Champlain is that of 1640, in 4to.

CHAMPOLLION, Jean François, le Jeune, celebrated for his discoveries in the department of Egyptian hieroglyphics, was born at Figeac, department of Lot, in 1790. He was educated partly at home, partly under his brother at Grenoble, and at an early age devoted himself to the study of Hebrew, Arabic, Coptic, &c. In 1807 he read a paper before the Academy of Grenoble on the ancient Egyptian geographical names, which he endeavoured to explain by the Coptic. He then went to Paris, where he continued his oriental studies, paying particular attention to the Coptic, and endeavouring through it to find the key to the Egyptian hieroglyphics. In 1809 he became professor of history at Grenoble, but soon retired from this post and went to Paris, where he devoted himself almost exclusively to the study of Egyptian antiquities. Assisted by the trilingual inscription of the Rosetta stone (which see), and also by the suggestions which had been thrown out by Dr. Thomas Young, he at length discovered the key to the graphic system of the Egyptians, the three elements of which—figurative, ideographic, and alphabetic—he expounded before the Institute in a series of memoirs in 1823. These were published in 1824 at the expense of the state, under the title of Précis du Système hiéroglyphique des anciens Égyptiens. In 1824 he went to Italy, and investigated the collections of papyri and other Egyptian antiquities in the principal cities there. In 1826 Charles X. appointed him to superintend the new department of Egyptian antiquities in the museum of the Louvre. In 1828 M. Champollion went as director of a scientific expedition to Egypt, at the expense of the king. He was admitted a member of the Academy of Inscriptions in 1830. In 1831 the chair of Egyptian archæology was created for him in the Collége de France. He died at Paris in March, 1832. His principal works are his Grammaire Égyptien, and Dictionnaire hiéroglyphique, both published after his death. They are indispensable to the student of hieroglyphics.

CHAMPOLLION-FIGEAC, Jacques Joseph, the elder brother of the preceding, was born at Figeac (department Lot) in 1778. He completed his studies at Grenoble, published his first archæological memoirs in 1803, and was named successively librarian of Grenoble, professor of Greek literature, secretary and dean of the Faculty of Letters of the same town. He took an active part in everything connected with science and letters in the department of the Isère, and contributed powerfully, along with M. Bertriat-Saint-Prix, to give a strong impulsion to historical labours in the Dauphiny. He himself composed a variety of works relative to this province. He acted as secretary to Napoleon in drawing up under his instruction the account of his memorable passage from Elba to Grenoble. In 1828 a place was made for him as keeper of the manuscripts in the royal library, and shortly afterwards he was installed in the chair of paleography in the École des Charts. He was deprived of these employments in 1848, but restored by the president of the republic in the following year. He was made an officer of the Legion of Honour in 1866; died 9th May, 1867. His principal works are: Antiquités de Grenoble, 1807; Paléographie Universelle; Annales des Lagides, 1819; Traite élémentaire d'Archéologie, 1843; Écriture démotique Égyptienne, 1843; L'Égypte Ancienne, 1850; besides several other interesting works on oriental history, and on the language and antiquities of the department of the Isère.

CHANCE. See Probability.

CHANCEL is that part of the choir of a church, between the altar or communion-table and the rail that incloses it, where the minister is placed at the celebration of the communion.

CHANCELLOR, an officer supposed to have been originally a notary or scribe, under the emperors, and named *cancellarius*, because he sat behind a lattice, called, in Latin, *cancelli*, to avoid being crowded by the people. There are, however, other derivations of this title. Whatever may have been its origin, the office and name of *chancellor* were undoubtedly known at the court of the Roman emperors, where the title seems to have signified, originally, a chief scribe or secretary, who was afterwards invested with several judicial powers, and with superintendence over the other officers of the empire. From the Roman Empire the title and office passed to the Roman Church, and hence every bishop has to this day his chancellor, the principal judge of his consistory. When the modern kingdoms of Europe were established upon the ruins of the empire, almost every state preserved its chancellor, with different jurisdictions and dignities, according to their different constitutions. In all, he seems to have had the supervision of all charters, letters, and such other public instruments of the crown as were authenticated in the most solemn manner, and therefore, when seals came into use, he had always the custody of the king's great seal. This officer has now great authority in all the countries of Europe.

The *Lord High-chancellor of Great Britain* (*origin-*

ally of England) is the first judicial officer of the crown, and exercises an extensive jurisdiction as head of the Supreme Court of Judicature recently established. He ranks as first lay person of the state after the blood-royal. He is always one of the commissioners appointed to represent the sovereign in opening and closing Parliament or giving the royal assent to bills. He is created by the delivery of the great seal into his custody. In like manner the act of taking away the seal by the sovereign formally determines his office. He is a cabinet minister and a privy-councillor in virtue of his office, is speaker of the House of Lords by prescription, and vacates his office with the ministry which appoints him. He has a salary of £10,000. He has the appointment of all justices of the peace in the kingdom, is visitor, in the king's right, of all royal foundations, and patron of all crown livings under the value of twenty marks in the king's books. The office having in early times been always filled by ecclesiastics (for no others were then capable of an employment requiring so much writing) he became keeper of the king's conscience; and, by special appointment, he now exercises a general superintendence as guardian over all infants, idiots, and lunatics, though these latter powers are not necessarily attendant on his office, as Blackstone seems to have imagined, but can be delegated by the crown to any other judicial officer, as in fact they were delegated even as late as the reign of James I., when the seals were held by Dr. Williams, then dean of Westminster, and afterwards bishop of Lincoln. The great seal has been not unfrequently put in commission, and was last so on the resignation of Lord Thurlow in the year 1793. One *vice-chancellor* was appointed to preside in the courts of equity by Act 53 George III. cap. xxiv., and two by Act 5 Vict. cap. v. sec. 19. The two last-mentioned were at first subordinate vice-chancellors, but they were afterwards all made of equal rank. They sat in separate courts, and an appeal lay from their decisions to the lord-chancellor. They latterly sat in the chancery division of the Supreme Court of Judicature. See CHANCERY and SUPREME COURT OF JUDICATURE.

Chancellors of Ireland and Scotland.—There is a Lord High-chancellor of Ireland, who is the head of the judicial bench, with a salary of £8000. He is not a member of the British ministry. The chancellorship of Scotland was abolished at the union. The Scottish chancellor had no independent jurisdiction *in equity*, as there has never been a separate court of equity in Scotland; but he presided in Parliament, and was head of all the courts of judicature, and of the Scottish office of chancery, in which all charters and other writs appointed to pass the great seal were recorded. This office still exists under a director of chancery.

The *Chancellor of the Exchequer* is the principal finance minister of the government, and as all questions of supply originate in the House of Commons, a peer cannot be conveniently appointed to this office. When the first lord-commissioner of the treasury is a commoner, the two offices have sometimes been united.

The *Chancellor of the Duchy of Lancaster* presides in the court of the duchy chamber, to decide questions relating to lands holden of the king, as Duke of Lancaster; but it does not appear that this is a court of record. The chancellorship is generally bestowed during pleasure, though there are two instances of its being granted for life; the last being that of the celebrated Lord Ashburton. The Chancellor of the Duchy of Lancaster is a cabinet minister.

The *Chancellor of a university* is an official at the head of the university, generally a man of rank, whose duties are more or less nominal, but who is regarded as conferring the degrees. At *Oxford* his duties are almost entirely discharged by the vice-chancellor; the chancellor's own acts being limited to the signing of diplomas, &c. Under the vice-chancellor are four pro-vice-chancellors, nominated by him from among the heads of colleges, to one of whom, in his absence from the university, he delegates his authority.

The *Chancellor of Cambridge University*, whose duties are very similar to those of the Oxford official, is elected biennially by the senate; but there is no instance, at least in modern times, where a re-election has not taken place.

Chancellor of the order of the Garter and other military orders, an officer who seals the commissions and the mandates of the chapter and assembly of the knights of the order, keeps the register of their proceedings, and delivers their acts under the seal of their order.—The title *chancellor* is given, in England, to several officers of other bodies.

The chancellor was one of the highest officers in the German states, and by the influence of his office was one of the most important. In Germany this dignity was from the remotest times vested in one of the higher clergy, until the head of the German clergy, the Archbishop and Elector of Mentz, united it for ever with his office as arch-chancellor of the empire. The two other spiritual electors held the same dignity, but it was merely titular; the Archbishop of Cologne, as Arch-chancellor of Italy; the Archbishop of Treves, as Arch-chancellor of Gaul and Arles, that is, the Kingdom of Burgundy, once belonging to Germany. The Arch-chancellorship of Mentz, on the contrary, had important duties attached to it—the direction of the diet, and of the public business, as well as of all the imperial chanceries. The elector appointed a vice-chancellor, who was the actual minister of the empire at the imperial court. In the New German Empire the chancellor (*Reichskanzler*) is the president of the Federal Council (*Bundesrath*), and has the general conduct of the imperial administration. All laws of the empire, after being sanctioned by the emperor, must be countersigned when promulgated by the chancellor.—The Chancellor of France was the highest officer of state, and the only one who, when once appointed, could not be dismissed. In case therefore it was desired to remove him from participation in affairs, a keeper of the seals (*garde des sceaux*) was appointed. As the chancellor was properly the minister of justice, he was chosen from the body of jurists. A relic of his spiritual character was, that all his furniture, liveries, and even his coach, were black.

CHANCELLORSVILLE, the site of one of the greatest battles of the American civil war, in which a nominal victory was gained by the Confederates under General Lee over the Federal troops commanded by General Hooker. General Hooker relieved General Burnside of his command on the 25th of January, 1863, the Federal army being then on the north side of the Rappahannock. The long-continued rains of spring prevented any advance of the army till near the end of April, when Hooker crossing the Rapidan and the Rappahannock, established his head-quarters in the house of Chancellorsville about 10 miles w. of Fredericsburg, the spot where Lee had defeated Burnside on 13th Dec. 1862. The Federal troops, 80,000 strong, occupied the wooded heights to the north of the Rappahannock, and the south of the small village of Massaponax. This advance determined General Lee also to take the offensive. Immediately before sunset on 2nd May "Stonewall" Jackson, at the head, it is said, of 50,000 men, fell like a thunderbolt upon the rear of the Federal army. At the sight of his men advancing at the double in massive columns, the German recruits commanded by General Howard took to flight; but Generals Sickles, Pleasanton, and Berry succeeded in bringing together an effective force and checking the advance of the attacking party. On the 3d the battle recommenced at break of day. Jackson, reinforced by two divisions of the corps of Longstreet, renewed the attack, which the best troops of the Federal army sustained, and repelled with such energy that after the loss of 10,000 men in repeated assaults the assailants were obliged to relinquish their enterprise. On the 4th Hooker, who had despatched General Stoneman to cut the points of the railway between the Confederates and Richmond, remained inactive, waiting intelligence from him. Lee seized the opportunity to throw his whole disposable force against the corps of General Sedgwick, and drove it across the Rappahannock. He then turned direct upon Chancellorsville with a view to co-operate with Jackson and place the Federal army between two fires. Hooker, unable to sustain the joint attack, recrossed the Rappahannock on the night of the 5th to 6th without being incommoded by the enemy, leaving the Confederates in possession of the field of battle, but carrying with him several thousand prisoners and one gun more than he had lost. The victory, such as it was, was dearly purchased by the loss of 15,000 to 18,000 men, including General Jackson, the most enterprising of the Confederate leaders, who was mortally wounded while returning from action on the evening of the 3d by his own men, who mistook him for one of the enemy.

CHANCE-MEDLEY, homicide happening either in self-defence, on a sudden quarrel, or in the commission of an unlawful act without any deliberate intention of doing mischief.

CHANCERY, a division of the High Court of Justice recently established, which is itself one of the two departments of the Supreme Court of Judicature (which see). Formerly it was the highest court of justice for England and Ireland, and it obtained its name from being under the presidency of the lord-chancellor. It embraced six superior courts called high courts of chancery, and numerous inferior courts. The superior courts were the court of the lord high-chancellor, the court of the master of the rolls; the court of appeal in chancery, constituted by the lord-chancellor sitting along with either of the two lords-justices in appeal or by the two lords-justices sitting together apart from the lord-chancellor; and the courts of the three vice-chancellors. The ordinary legal jurisdiction of chancery embraced the issuing of writs for a new Parliament; of pleas of *scire facias* to repeal letters-patent, and of all original writs. There was also a jurisdiction acquired by statute or special delegation in issuing writs of Habeas Corpus and inquiring into charitable uses. There were numerous other powers conferred by act of Parliament, and the lord-chancellor, together with the lords-justices of appeal, had exclusive authority over the persons and property of idiots and lunatics. Appeals in bankruptcy were heard by the court of appeal in chancery. The sittings and business of this court of appeal were regulated by the lord-chancellor.

The present judges of chancery, as a division of the High Court of Justice, are the lord-chancellor, who presides over the division, and five justices, each of whom has the title of 'Sir' and receives a salary of £5000. According to the provisions of the act by which the Supreme Court of Judicature was established there were to be no more judges appointed than were already connected with the court; and the distribution of business, both as to its commencement and its transfer, was made subject to rules of court and orders of transfer. By the operation of these provisions chancery, like the other divisions of the court to which it now belongs, was gradually to cease to be a separate department; but in the meanwhile, subject to these rules and orders, certain causes and matters were assigned to chancery until these provisions should take their full effect. These are enumerated in the 34th section of the Supreme Court of Judicature Act (36 and 37 Vict. cap. lxvi.), and are (1) all causes and matters pending in the High Court of Chancery at the commencement of the act (finally fixed for the 1st of Nov. 1875); (2) all causes and matters to be commenced after the commencement of the act under any act of Parliament by which exclusive jurisdiction in respect to such causes or matters has been given to the court of chancery, or to any judges or judge thereof, except appeals from county courts; (3) all causes and matters for the administration of the estates of deceased persons; for the dissolution of partnerships or the taking of partnership or other accounts; for the redemption or foreclosure of mortgages; for the raising of portions or other charges on land; for the sale and distribution of the proceeds of property subject to any lien or charge; for the execution of trusts, charitable or private; for the rectification or setting aside or cancellation of deeds or other written instruments; for the specific performance of contracts between vendors and purchasers of real estates, including contracts for leases; for the partition and sale of real estates; for the wardship of infants and the care of infants' estates. Chancery, as a division of the High Court of Justice, has no exclusive right to the administration of equity, the act already mentioned making provision under certain rules for the concurrent administration of law and equity in all the divisions of the Supreme Court of Judicature. The court of appeal in chancery no longer exists, and its functions are transferred to the Court of Appeal, which in the new Supreme Court of Judicature is the complementary department to the High Court of Justice. The affairs of lunatics are still under the supervision of the lord-chancellor.

CHANDA, a town of India, chief town of a district of same name in the Central Provinces. It is situated amid fine scenery, and is surrounded by a stone wall 5½ miles in circuit, inside which are cultivated fields and detached villages, while there are also suburban quarters outside. There is a citadel, now inclosing the jail, tomb of the Gond kings, three interesting temples, massive monoliths, &c. The town has a public park, civil station, and military cantonments. The manufactures include cottons, silks, brass utensils, &c. There is an annual fair beginning in April and lasting three weeks. Pop. 16,000.

CHANDAUSI, a town of India, in the North-Western Provinces, 27 miles south of Moradabad. It is the centre of a considerable trade, especially in sugar and cotton, and has limestone quarries. Pop. (1891), 28,111.

CHANDERI. See CHANDHEREE.

CHANDERNAGORE, or CHANDARNAGAR, a town in Hindustan, belonging to France, on the right bank of the Hooghly, 16 miles north-north-west of Calcutta. The French established a factory in it in 1676, and in 1688 obtained a formal cession of it, together with its territory of about 3½ square miles, from Aurungzebe. It was afterwards fortified, and continued to flourish till 1757, when the British took it and dismantled its fortifications. It was restored to the French in 1816. Its only manufacture is of cotton cloth, and there is no trade but with Calcutta. The climate is much cooler than that of Calcutta. Chandernagore is under a sub-governor, subordinate to the governor of Pondicherry. Pop. of town and territory (1891), 24,281.

CHANDHEREE, or CHANDERI, a decayed town of Scindia's Dominions (Gwalior), Central India, 105 miles S. of the town of Gwalior. It contains many ruins which attest its former greatness and magnificence. The fort, which figures much in the wars of the Mogul dynasty, is seated on a lofty hill, and is inclosed by a strong stone rampart, flanked with circular towers. Pop. (1891), 5073.

CHANDLER, RICHARD, D.D., Greek scholar and traveller, born at Elson, Hants, in 1738, was educated at Winchester School, whence he passed to Queen's and Magdalen Colleges, Oxford. He first brought himself into notice by the publication of his Marmora Oxoniensia (folio, Oxford, 1763). He was admitted a member of the Antiquarian Society, and was sent by the Dilettanti Society to travel in the East, for the purpose of making antiquarian researches and collections. On his return he published the results in important illustrated works entitled Ionian Antiquities, and Inscriptiones Antiquæ, and also in two volumes of Travels in Greece and in Asia Minor. These travels are still among the best of their class. He is also the author of a History of Ilium or Troy, in which he maintains the reality of the Trojan war, in opposition to Bryant. He died rector of Tilehurst, in Berkshire, on Feb. 9, 1810.

CHANG-CHOO-FOO, a city, China, province of Fokien, 23 miles W.N.W. of Amoy, which is its port. It stands in a valley surrounded by hills and intersected by a river. Its walls are about 4½ miles in circuit, and immediately within is a space planted with large trees. It is the centre of the silk manufacture of the province. Pop. 500,000.

CHANNEL, ENGLISH. See ENGLISH CHANNEL. For the CHANNEL TUNNEL see DOVER (STRAITS OF).

CHANNEL ISLANDS, a group of islands in the English Channel belonging to Britain, off the W. coast of department La Manche, in France. They consist of Jersey, Guernsey, Alderney, and Sark, with some dependent islets. They are picturesque and very fertile, and are celebrated for a peculiar breed of cattle the chief strains of which are the Jerseys, the Guernseys, and the Alderneys, which differ from each other in minor characteristics. The islands are almost totally exempt from taxation, and the people enjoy besides all the privileges of British subjects. There are two lieutenant-governors, one for Jersey, and the other for Guernsey, Alderney, and Sark. The government is in the hands of two corresponding bodies called the 'states', some members of which are named by the crown, while others are chosen by the people, and others sit *ex officio*. These islands have been fortified at an immense expense. Ecclesiastically they belong to the diocese of Winchester. The Channel Islands form the only remains of the Norman provinces once subject to the English crown. They now export large quantities of fruit, vegetables, and flowers to the English markets, including grapes, tomatoes, and potatoes, partly grown under glass. The fisheries also are important. French is generally spoken. Area, 75 square miles. Pop. (1891), 92,234. See the separate articles on the islands.

CHANNELS, or CHAIN-WALES, of a ship, pieces of wood or iron projecting edgewise like a ledge from the ship's outside, abreast of, and extending somewhat behind the masts. They serve to extend the shrouds and to prevent them from touching the gunwale, or being injured by rubbing against it.

CHANNING, WILLIAM ELLERY, an eminent American preacher and writer, born at Newport, Rhode Island, on April 7, 1780, studied at Harvard College, at first with a view to the medical profession, but soon abandoned the idea, and turned his attention to theology. His early views are said to have been evangelical, but he soon became a decided Unitarian, and propagated the peculiarities of this theological system so termed with great zeal and success. His first appointment as a preacher was in 1803, when he obtained the charge of a congregation in Federal Street, Boston. His hearers, at first few in number, rapidly increased by the fame of his eloquence, and soon required the accommodation of a new and much larger church. He had long possessed a distinguished reputation in America before he was much known in England; but two papers which he had got inserted in the Christian Examiner, the one a review of Milton's Treatise of Christian Doctrine, and the other a review of Sir Walter Scott's Life of Napoleon, having been separately republished here, under the title of Remarks on the Character and Writings of John Milton, and Remarks on the Life and Character of Napoleon Bonaparte, they attracted much attention by their ability and eloquence, and led to the republication of his collected writings in a variety of forms, of which that published at Glasgow in 1840, in six vols. 8vo, is the most complete. Some of his writings have been translated into French and German. They consist chiefly of sermons, reviews, and miscellaneous tracts, on such subjects as war, temperance, education, and slavery. He died at Bonnington, Vermont, Oct. 2, 1842.——His nephew, WILLIAM HENRY CHANNING, born at Boston on May 25, 1810, graduated at Harvard in 1829, and became Unitarian minister at Cincinnati in 1839. He afterwards removed to Boston, Rochester, and New York, in all of which he gained great fame as an eloquent preacher. In 1854–62 he was in England, and for a time officiated as a minister in Liverpool. Returning to America, he accepted a pastorate in Washington, and was for two years chaplain to the senate. On the conclusion of the civil war he came to England, where he resided almost continuously till his death at London on Dec. 23, 1884. He was associated with the Christian Socialist and other humanitarian and idealist movements. His chief work is the life of his uncle (3 vols., 1848).

CHANTIBUN, or CHANTABUN, a seaport of Siam, on the east side of the Gulf of Siam, at the mouth of a river of same name. It is a place of considerable trade, and gives access to a rich mineral district. It has been held by the French since 1893. Pop. 7000.

CHANTILLY, a town, France, department Oise, 25 miles N.N.E. of Paris, on the Nonnette, celebrated for its splendid château, built for the Duc d'Aumale in 1876. It stands on the site of an older château which first became important under Anne de Montmorency. In 1632 it passed to the house of Condé, but the greater part was demolished at the revolution. The last prince of Condé bequeathed the domain to the Duc d'Aumale in 1830. The present building and domain, including fine grounds and gardens, an extensive forest, &c., were presented by the duke to the French Institute in 1886. The château contains a valuable library and a precious collection of works of art. The place was formerly celebrated for its manufacture of lace ('Chantilly lace'). It is a great horse-racing and training centre. Pop. (1896), 4211.

CHANTREY, SIR FRANCIS LEGATT, an eminent sculptor, born on April 7, 1781, near Norton, a village in Derbyshire about 4 miles S. of Sheffield, was the son of a carpenter, who, in addition to his principal occupation, farmed a few fields as tenant, and possessed a little landed property. The chief amusement of his boyhood was in modelling figures in clay and drawing likenesses, but notwithstanding this decided natural bent, it was proposed to make him an attorney. At his own request, however, he was apprenticed in 1797 to Mr. Ramsay, a carver and gilder at Sheffield. Here he attracted the attention of Mr. J. Raphael Smith, a mezzotinto engraver and portrait-painter, who, perceiving his decided inclination for drawing and modelling, gave him instructions which tended greatly to prepare him for his future career. In 1802 he commenced life in Sheffield by taking portraits in crayon. By 1804 he was resident in London, and intimated that he had begun 'taking models from the life'. Here he improved himself by studying at the Royal Academy. He still kept up his connection with Sheffield, and having acquired much reputation as a sculptor, he became the successful candidate for the marble bust which the inhabitants of Sheffield had resolved to erect to the memory of the Rev. J. Wilkinson. This interesting work, which may be said to have finally decided his future course, is in Sheffield Parish Church. Having settled permanently in London, he presented numerous busts at the exhibitions of the Royal Academy. One of these, in 1811, is said to have attracted the admiration of Nollekens, who had the generosity to exclaim, 'There's a fine, a very fine *busto*; remove one of my busts and put this one in its place, for it well deserves it'. This appears to have greatly contributed to his fame and fortune. About the same time he was a successful candidate for a statue of George III. for the city of London, and soon was almost universally regarded as the first monumental sculptor of the day. In 1815 he was chosen an associate and in 1818 a member of the Royal Academy. In 1819 he visited Italy, where he was elected member of the academies of Rome and Florence. He was knighted in 1835, and died suddenly on 25th Nov., 1842, of disease of the heart, from which he had long been suffering. His most celebrated works are the Sleeping Children, a monument erected to two children of the Rev. W. Robinson, in Lichfield Cathedral; the statue of Lady Louisa Russell, daughter of the Duke of Bedford, in Woburn Abbey; Lady Frederica Stanhope with her infant child, in Chevering Church; Sir Joseph Banks, at the British Museum; Roscoe and Canning, at Liverpool Town Hall; James Watt, at Glasgow; the bronze statue of William Pitt, in Hanover Square, London; and statues of Horner, Sir J. Malcolm, &c., in Westminster Abbey. His finest works are his busts, among the best of them being Sir Walter Scott, Watt, Wordsworth, and Porson. His full-length figures are said to betray an insufficient acquaintance with anatomy, and several of his equestrian statues in bronze are still more defective. The postures are formal, and the horses, in their bodies and limbs, are very inanimate. Sir Francis had acquired an ample fortune, and having died without family, made munificent bequests for the advancement of art, the Royal Academy being endowed with a large fund for the purchase of works of sculpture and painting by artists residing in Britain.

CHANTRY (French, *chanter*, to sing), an endowment to provide for the singing of masses, and the chapel where the masses are chanted. Chantry chapels were frequently endowed by the will of the founders in order to have mass sung for the repose of their souls. The practice of founding chantries was formerly common in Roman Catholic countries, particularly in connection with abbeys, where it was considered a distinction to be buried. Chantries may be seen in the cathedrals of Winchester, Wells, Salisbury, &c.

CHANZY, Antoine Eugène Alfred, French general and politician, was born at Nouart, in the department of Ardennes, on March 18, 1823, and died at Châlons-sur-Marne on January 4, 1883. After a course at the military school of Saint Cyr, he became sub-lieutenant of infantry in 1843, and was sent to Algeria. He subsequently served in Italy and Syria, but on becoming colonel he returned to Africa in 1868. On the outbreak of the war with Germany, in 1870, he was created a general of division, and after gaining the battles of Coulmiers and Patay, was put in command of the second army of the Loire. Here he fought heroically against the much stronger and more disciplined Germans, but finally had to retreat. He was elected to the National Assembly for the department of Ardennes, and during the Commune he narrowly escaped with his life. In 1873 he went to Algeria as governor-general, and in 1879 he stood for the presidency. In that year also he was sent to Russia as ambassador, a post which he held till 1881, when he became commander of the sixth army corps.

CHAO-CHOW, a city of China in the province of Quangtung, on the River Han, 195 miles N.E. of Hong-Kong. It is the centre of an important maritime division of the province. The channel leading to it is very shallow, so that ships of large burden can sail up only at high water. This city was included in the Treaty of Tientsin (1858) as a port open to foreign trade, but the foreign trade is transacted at Swatow.

CHAOS, according to the signification of the word, the void which embraces all things. Hesiod mentions, as the original principles of all things, Chaos, Earth, and Eros (Love); other ancient poets made Chaos alone the primeval source from which everything is derived; others added to it Night, Erebus, and Tartarus; and others still represented Chaos as the parent of the Earth and Heaven; after the production of which Eros (Love) completed the creation. Modern writers commonly understand by chaos the unformed primeval matter from which the universe was made.

CHAP-BOOKS, a species of cheap literature, in the form of small pamphlets, which preceded the popular periodicals of the present day. They were so called because they were prepared expressly for sale by the chapmen, or pedlars, who hawked them from district to district. They were largely productions of the provincial presses. The writers are mostly unknown, but one of the authors of Scottish chapbooks was Dougal Graham (1724–1779), bellman of Glasgow. Their matter was of the most varied character, and some of them were decidedly coarse and vulgar.

CHAPEL (French, *chapelle*, Latin, *capella*), a name for religious edifices of various kinds, especially for such as hold a subordinate position. In England and Scotland there are several sorts of chapels—parochial chapels, subordinate to, but distinct from, the mother church; chapels of ease, built for the accommodation of the inhabitants in large parishes; university chapels, and private chapels, whose names explain their uses. The term is also applied to small buildings attached to cathedrals, and separately dedicated.

CHAPELAIN, Jean, a French poet, was born in Paris, Dec. 4, 1595. Chapelain was possessed of talents and learning as well as discretion, and having gained the favour and patronage of Cardinal Richelieu, his fortune was made. He became one of the first members of the Académie Française, and was charged with its organization. Colbert intrusted him with the nomination of the *savants* on whom Louis XIV. conferred pensions, a task which he appears to have executed creditably. He received a large pension, and became the oracle of the French poets of that time. His Maid of Orleans (Pucelle) was begun in 1630, and was consequently one of the first epic attempts in French literature. It consists of twenty-four books or cantos. As it was announced twenty years before its publication, great expectations had been raised, which were by no means realized on the appearance in 1656 of the first twelve books. In the first eighteen months, indeed, six editions were rapidly sold; but it soon became an object of ridicule with the French critics, particularly with Boileau, and sunk into oblivion. An edition appeared at Geneva in 1762, containing eighteen books, but the complete work has never been published. It contains some passages manifesting ability, but they are too few to redeem a work of such magnitude. As a man, Chapelain was universally esteemed. He died in 1674.

CHAPLAIN, a clergyman not having a parish or similar charge, but connected with a court, the household of a nobleman, an army, a prison, a ship, or the like. In England there are thirty-eight clergymen of the established church appointed as chaplains in ordinary to her majesty, besides a domestic chaplain to her majesty, a chaplain of her majesty's household, and honorary chaplains in ordinary. There are also a number of chaplains, of different denominations, connected with the army, appointed by the secretary of war and placed under the chaplain general. They are not attached to individual regiments, but to the staff of the army. In the navy there is a chaplain for each vessel.

CHAPMAN, George, an English poet, the earliest, and perhaps the best, translator of Homer, was born in 1557, probably at Hitching Hill in Hertfordshire, at which place he is known to have for some time resided. He was educated at Oxford, and in 1576 proceeded to London, where he made the friendship of Shakspere, Spenser, Marlowe, and other distinguished writers of the time. As to his personal history little is known, but he is supposed to have held some post in connection with the court. The first of his works, so far as is known, was the Shadow of Night, a poem published in 1594. His translation of the Iliad, in rhyming lines of fourteen syllables each, was published in three separate portions, in 1598, 1600, and 1603. It has been highly commended by such poets as Pope, Keats, and Coleridge, as also by Lamb. Keats's sonnet On First Looking into Chapman's Homer ('Then felt I like some watcher of the skies,' &c.) is well known. In 1614 appeared his translation of the Odyssey in the same metre as the Iliad, followed in the same year by that of the Battle of the Frogs and Mice and the Homeric hymns. He also translated Hesiod's Works and Days and portions of various classic poets. He wrote numerous plays, almost all now forgotten, though containing some fine passages. The earliest of these was The Blind Beggar of Alexandria, a comedy, 1598. He was associated with Jonson and Marston in writing the comedy of Eastward Ho! which from its satirical reflections on the Scotch is said to have nearly brought severe punishment on the authors. Among his tragedies are Bussy d'Ambois, Cæsar and Pompey, Revenge for Honour, and two dramas on the life of Marshal Biron, which A. C. Swinburne characterizes as 'a storehouse of lofty thought and splendid verse, with scarcely a flash or sparkle of dramatic action.' He died in London in 1634. An edition of his works was published in 1873–74 (London, three vols.).

CHAPOO, a seaport, China, province Chekiang, on the N. side of a large bay, 35 miles N. from Ningpo. It is fortified and garrisoned by Manchoo troops, carries on a very considerable trade, and was once the only Chinese port which was permitted to trade with Japan. The British took it in 1842, after a vigorous resistance.

CHAPPE, Claude, born in 1637, is celebrated as the inventor of the aërial telegraph, which, before the invention of the electric telegraph, was frequently used for the same purpose. Wishing to communicate with his friends who lived at the distance of several miles, he conceived the idea of conversing with them by means of signals; and his experiments for this purpose led him to his important invention. Having succeeded in erecting his machine on a large scale, he laid a description of the work, which he called *telegraph*, before the National Assembly in 1792. The establishment of the first telegraphic line was ordered in 1793: the first event communicated by it was the capture of Condé. The convention having received this news at the opening of a session, forthwith decreed that Condé should be called in future *Nordlibre*, and was apprised, in the same sitting, that the edict had been delivered and published to the army. The signals of Chappe's machine are very distinct, while its motions are easy and simple. It may be erected at any place, defies every kind of weather, and, notwithstanding its simplicity, contains signs enough to convey any ideas, in such a way that not more than two signals are commonly necessary. A machine of this kind at Liverpool communicated intelligence to that at Holyhead, a distance of 156 miles, and received an answer, the whole in less than thirty-five seconds. The honour of this invention was contested by many persons. The chagrin which these disputes produced in the mind of Chappe plunged him into a deep melancholy, and in 1805 he put a period to his existence by throwing himself into a well.

CHAPTAL, Jean Antoine Claude, Count of Chanteloup, peer of France, was born in 1756 at Nogaret (Lozère), and devoted himself to the study of medicine and the natural sciences. Having been long known as a distinguished physician, he rendered himself conspicuous as an adherent to the cause of the revolution, at the assault upon the citadel of Montpellier in 1791. Being called to Paris in 1793, on account of the scarcity of gunpowder, his chemical knowledge, and his activity in the enormous factory at Grenelle, enabled him to supply the necessary quantity, by the production of 3500 lbs. every day. In 1794 he returned to Montpellier, received a place in the administration of the department of the Hérault, and the professorship of chemistry, which had been founded there for him. In 1798 he was made a member of the Institute, favoured the revolution of the 18th Brumaire (which see), was appointed by the first consul, in 1799, counsellor of state, and in 1800 minister of the interior, in which post he encouraged the study of all the arts, and established a chemical manufactory in the neighbourhood of Paris. In 1804 he fell into disgrace: the reason assigned is, that he refused to declare, in one of his reports, that sugar prepared from beet was better than that from the sugar-cane. In 1805, however, he was made, by the emperor, Grand Cross of the Legion of Honour, and member of the Conservative senate. After the return of Napoleon from Elba he was appointed director-general of commerce and manufactures, and minister of state. On the restoration of the king he was obliged to retire to private life, and at the same time to enter into negotiations with the Princess of Orleans relative to Chanteloup, which formerly had belonged to her. In March, 1816, the king nominated him a member of the Academy of Sciences. Chaptal's works on national industry, chemistry, the cultivation of the vine, &c., were very much esteemed; especially his Chimie Appliquée aux Arts (Paris, 1807, four vols.); his Chimie Appliquée à l'Agriculture (Paris, 1823, two vols.); and De l'Industrie Française (Paris, 1819, two vols.).

He was director of two chemical manufactories at Montpellier and Neuilly. He discovered the mode of dyeing cotton with Turkish red. He invented several kinds of cement and artificial Puzzolanas, by means of native calcined ochre, without the aid of foreign matters; new varnishes for earthenware, without the use of lead ores and plumbago, &c., so often destructive of health and life; and extended the application of chemical agents to bleaching. He died in 1832.

CHAPTER (from the Latin *caput*, head), one of the chief divisions of a book. As the rules and statutes of ecclesiastical establishments were arranged in chapters, so also the assembly of the members of a religious order, and of canons, was called a *chapter*, because some or all of the chapters containing the rules were read there; and the place where they assembled, as well as the reproof administered to a delinquent member, by reading the rules of the chapter transgressed, had the same name. The orders of knights, which originally had much of the ecclesiastical constitution, used this expression for the meetings of their members, and even some corporations of mechanics or tradesmen call their assemblies *chapters*. In England, as elsewhere, the deans and chapters had the right to choose the bishop, but Henry VIII. assumed this right as a prerogative of the crown.

CHAR, or CHARR (*Salmo umbla*), a fish of the salmon genus, found plentifully in the deeper lakes of England, Wales, and Ireland, more rarely in those of Scotland. The chars inhabit the colder regions of deep waters, where the temperature is less liable to vary. It is only in the colder months that they sport near the margin and proceed in great numbers up some river, or even to some shallow part of the lake itself, to shed their spawn; in either case the situation must have a rocky bottom. It is during their spawning season that the char-fishing is carried on, for the most part with nets. Sometimes the quantity taken amounts to twenty or thirty at a haul, but usually it is much less. There are several varieties of this fish, all having intense and beautiful colours; length from 10 to 15 inches; weight sometimes as high as 2 lbs., but generally ranging under 1 lb.—All kinds are held in esteem for the table, but as they soon lose their flavour they are preserved in pots, in which condition they form a fashionable dish. The fish is found in the Lake of Constance, where it goes under the name of the *rothel*, and in the Lake of Geneva, where it is called the *ombre chevalier*.

CHARACEÆ, an order of cryptogamous plants, division Algæ, composed of an axis consisting of parallel tubes, which are either transparent or incrusted with carbonate of lime, inhabiting stagnant water, both fresh and salt, beneath which they are always submersed. They are found in almost every part of the world, but are most common in the temperate zone. The fetid odour which they emit renders the surrounding locality very unhealthy, and is believed to be one of the causes of the malaria in the Campagna di Roma.

CHARACTER, SERVANT'S. A master is not bound to give a servant a character; but if he gives one, he must take care that it is a true one as far as he knows, otherwise he will be held liable. No action of course can be taken if the character has been a verbal one. If any person falsely represents himself to be the master of the party producing a document signed by him; or if any master gives a false character of a servant; or if any servant bring a false character, the offender is liable to a fine of £20, with 10*s.* costs.

CHARADE, a syllabic enigma, that is, an enigma the subject of which is a name or a word that is proposed for discovery from an enigmatical description of its several syllables, taken separately, as so many individual words. A charade may be called complete if the different enigmas which it contains are brought into a proper relation to each other, and, as a whole, unite in an epigrammatic point. The French excel in this species of literary amusement. —*Acting Charades*, a kind of entertainment made up of pantomime and dialogue, and improvised by the members of an evening party. The syllables and complete word are meant to be suggested by the various divisions of the piece.

CHARCOAL. See CARBON.

CHARD, a town, England, county of Somerset. It is situated 43 miles S.S.W. from Bristol, and contains a town-hall, a museum, an extensive market-place, alms-houses, and a grammar and large board schools; also places of worship for Episcopalians, Congregationalists, Baptists, and Wesleyans, with two railway stations on the South-Western and Great Western lines. The lace manufacture is carried on, and there are linen collar works and other establishments, and a considerable trade in grain and agricultural produce. Pop. in 1891, 4315; in 1901, 4437.

CHARDIN, JEAN, son of a Protestant jeweller in Paris, and a jeweller himself, was born in 1643. Before he had reached his twenty-second year his father sent him to the East Indies in order to buy diamonds. After a short residence in Surat, Chardin lived six years in Ispahan, where he was less engaged in mercantile business than in profound studies and scientific researches, making use of his connections at court for collecting the most authentic information of the political and military state of Persia. He collected the most valuable materials relating to antiquities and history. In 1670 he returned to France. Finding, however, that he could hope for no employment on account of his religion, he again left France for Persia, in 1671, taking with him a considerable quantity of precious stones artistically set, exquisitely-worked jewelry, &c. He spent ten years partly in Persia and partly in India. In 1681 he arrived in London, when he received the honour of knighthood. He published the first volume of his Travels, in London, in 1686. The other volumes were about to follow, when he was appointed minister plenipotentiary of the King of England to the States-general of Holland, and agent of the English East India Company to the same. His new duties did not distract him from his favourite employment, so that in 1711 two editions of his Travels appeared. He soon after returned to England, where he died in 1713. The exactness and truth of his statements, and the extent of his knowledge, have been confirmed by all succeeding travellers, and have been serviceable to Gibbon, Helvetius, and Montesquieu. The best edition of Chardin's Travels is that by Langlès, 1811, in ten vols. 8vo, with an atlas in folio.

CHARENTE, a river in France, rising in the department of the Upper Vienne. It falls into the sea about 8 miles below Rochefort, opposite to the isle of Oleron, after a course of about 200 miles. It gives its name to two departments.

CHARENTE, an inland department, France, having N. the departments Deux-Sèvres and Vienne, E. Haute-Vienne, S.E. Dordogne, and W. Charente-Inférieure, formed chiefly out of the ancient province of Angoumois, and deriving its name from the river Charente, by which it is traversed, between lat. 45° 23′ and 46° 15′ N.; and lon. 0° 29′ W. and 0° 54′ E.; area, 1,487,447 acres; capital, Angoulême. It is in general uneven, with hills covered with chestnut-trees, sandy plains, meadows, &c. Soil thin, dry, and arid; one-third devoted to tillage, a third to vineyards, and the remainder meadows, woods, and waste lands. The principal rivers are the Charente, joined by the canal of Poitou with the Vienne, the Dronne.

Tardoire, Bandiat, Touvre, and Né, all abounding in fish. Waterpools are numerous. The climate is temperate, atmosphere clear, and extremes of heat or cold are almost unknown. The cereal productions are wheat, rye, oats, millet, maize, and buckwheat; but the produce is insufficient for the local consumption. Truffles are abundant. The wines of the department are of inferior quality, and in little request for the table; but they yield the best brandy in Europe. The celebrated cognac brandy is made in the districts of Champagne, Cognac, Jarnac, Rouillac, and Aigre from a grape called the *folle blanche*, which yields a white wine. The red wines furnish an inferior brandy, without the bouquet that distinguishes the genuine cognac. The wine-growers themselves carry on the distillation, each estate being furnished with stills and the necessary apparatus. Pastures are scarce, but cattle are fattened to some extent. Large numbers of pigs are also fattened, and poultry is abundant, as well as game of all kinds. Iron ore is found in the department, and small quantities of lead and antimony. Excepting brandy and paper, the manufactures of the department are inconsiderable, consisting of sacking, cloth, cordage, hats, corks, and earthenware. The paper made at Angoulême is said to be the best in France. The department is divided into the five arrondissements of Angoulême, Barbezieux, Cognac, Confolens, and Ruffec. Pop. (1886), 366,408; (1896), 356,236.

CHARENTE-INFÉRIEURE (Lower Charente), a maritime department of France on the west coast; having, N., department Vendée, N.E. Deux Sèvres, E. Charente, S.E. Dordogne, S. Gironde, and W. the Atlantic Ocean. It comprises parts of the former provinces of Angoumois and Poitou; area, including the islands of Ré, Oléron, Madame, and Aix, 2635 sq. miles. Surface in general flat, one-sixth consisting of marshes drained and cultivated, formerly sources of disease and death, now healthful and productive. Soil chalky and sandy, fertile, and well cultivated; and a considerable portion planted with vines. The pastures are good, and well stocked with cattle, horses, and sheep. Along the coast are extensive salt-marshes, from which an immense quantity of salt is produced. The extent of coast, including the east bank of the Gironde, is about 100 miles, on which are numerous bays, several seaports, and good roadsteads. The principal rivers that traverse or bound the department are the Charente, Gironde, Seudre, Boutonne, and Sèvre Niortaise—all of which are navigable, as well as the canal of Brouage, and that between Niort and Rochelle. The produce consists of grain of all kinds, more than sufficient for the consumption of the inhabitants. The wine is of common quality, and chiefly used for making brandy. Game is plentiful, and large flocks of wild fowl frequent the marshes. Oysters and sardines abound on the coast. Salt and brandy are the only articles manufactured to any great extent; but woollen goods hosiery, leather, pottery, and vinegar are also made; and ship-building is carried on in the seaports, where vessels are equipped also for the cod-fishery. Principal towns —Rochelle (cap.), Rochefort, Marennes, Saintes, and St. Jean d'Angély. The department is divided into the six arrondissements of La Rochelle, Jonzac, Marennes, Rochefort, Saintes, and St. Jean d'Angély. Pop. (1886), 462,803; (1896), 453,455.

CHARENTON-LE-PONT, a town in France, situated about a mile to the south-east of Paris, with which it is connected by rail and tramway, at the confluence of the Marne with the Seine. It has numerous mercantile and manufacturing establishments. The stone ten-arched bridge across the Marne used to be considered as the key to Paris on this side; hence the memorable attacks upon it both in the civil wars of France and in those with foreign enemies. At Petit-Charenton is the celebrated hospital for the insane, where many unfortunate individuals of both sexes (usually over 500) are treated with great care. Pop. (1896), 16,811.

CHARGE, in heraldry, signifies the various *bearings*, that is, ordinaries and figures depicted on the escutcheon (see HERALDRY).—In gunnery *charge* signifies the quantity of powder used at one discharge of a gun.

CHARIKAR, a town of Afghanistan, in the district of Kohistan, 36 miles north of Cabul. It has a trade in the coarse cotton cloths manufactured throughout the district, and in iron, and also a considerable transit trade to Turkestan and Central Asia. Charikar is the place of residence of the governor of Kohistan; and duties are levied here on merchandise passing between it and Turkestan. Near it ruins have been found, which are supposed to be those of a city founded by Alexander the Great. Pop. 5000.

CHARIOT. The chariots of the ancients were strongly and even elegantly built, but were not well adapted for speed. Those of the Romans were named according to the number of horses used to draw them. Thus a chariot with two horses was called a *biga*; one with three a *triga*; one with four, a *quadriga*, &c. The Romans yoked their horses in their race-chariots abreast. It is recorded that Nero once drove a chariot at the Olympic games with ten horses abreast. (See CIRCUS.) In ancient warfare chariots were of great importance; thus we read of the 900 iron chariots of Sisera, as giving him a great advantage against the Israelites. The Philistines in their war against Saul had 30,000 chariots. The sculptures of ancient Egypt show that the chariots formed the strength of the Egyptian army, these vehicles being two-horsed, and carrying the driver and the warrior, sometimes a third man, the shield-bearer. There is no representation of Egyptian soldiers on horseback, and consequently when Miriam in her song of triumph over Pharaoh speaks of the horse and his rider, rider must be understood to mean chariot-rider. In the Egyptian chariots the framework wheels, pole, and yoke were of wood, and the fittings of the inside, the bindings of the framework, as well as the harness, were chiefly of raw hide or tanned leather. We have also numbers of sculptures which give a clear idea of the Assyrian chariots. These resembled the Egyptian in all essential features, containing almost invariably three men—the warrior, the shield-bearer, and the charioteer. A peculiarity of both is the quiver or quivers of arrows attached to the side. War-chariots had sometimes scythe-like weapons attached to each extremity of the axle, as among the ancient Persians and Britons. In Britain the name chariot was formerly given to a kind of light travelling carriage.

CHARITABLE TRUSTS. By English law all bequests for charitable purposes to be valid must be strictly for the public benefit; that is to say, in favour of institutions for the advancement of learning, science, and art, for the support of the poor, or for other objects connected with the welfare of the public; and such bequests include those in favour of the church or of other religious bodies sanctioned by the law. Bequests for superstitious uses are null and void. A body of commissioners (the Charity Commissioners), under whose superintendence such benevolent trusts are placed, was established under the Charitable Trusts Act of 1853. They have the power of inquiring into the administration of all English public charities. See MORTMAIN.

CHARITON, the author of a romance which describes in Greek prose the loves and adventures of Chæreas and Callirrhoë, and, considering its period, is a very tolerable production. Some critics have thought that the name and birthplace usually assigned to the author are fictitious, and that it is by no means certain that he was a native of Aphrodisias in Caria, or that his name was Chariton. He appears to have lived about the fourth, fifth, or sixth century after Christ. The romance was first published with a learned commentary by D'Orville (three vols. 4to, Amsterdam, 1750), from a MS. in Florence, the only one yet known. An improved text by Beck, with a Latin translation by Reiske, appeared in 1783. German translations have been made by Heyne (1753) and Schmieder (1807).

CHARITY, Brothers and Sisters of. See Fraternities.

CHARIVARI, the name given, especially in France, to a serenade of kettles, pans, and discordant sounds by which the public displeasure is expressed to the party thus favoured. Such serenades were common in the middle ages, and are still occasionally given to persons who have made themselves ridiculous by absurd marriages or otherwise. In modern times Charivari is the name given to periodicals in which ministers of state and other political personages or public characters are ridiculed or caricatured. The French first set the example of these papers, and have found many imitations in other countries. Punch is an excellent specimen of the genus Charivari.

CHARKOV. See Kharkov.

CHARLEMAGNE (*Carolus Magnus*, Charles the Great), King of the Franks, and subsequently Emperor of the West, was born in 742, probably at Aix-la-Chapelle. His father was Pepin the Short, king of the Franks, son of Charles Martel. After the decease of his father, in 768, he was crowned king, and according to the wish of Pepin divided the Frankish dominions with his younger brother Carloman; but the conditions of this partition were several times altered, without being ever adjusted to the satisfaction of the parties. Their mutual discontent was fostered principally by the King of the Lombards, Desiderius (the father-in-law of both princes), because Charlemagne had repudiated his wife. Desiderius sought revenge for the rejection of his daughter by exciting and encouraging commotions in the realm, in which he was assisted by the circumstance that the nobles aspired to independence. The people of Aquitania were the first who attempted to become independent. Charlemagne marched against them with rather a small army; but he relied on the assistance of his brother Carloman, to whom a portion of Aquitania then belonged. Carloman appeared, indeed, on the field, but at the decisive moment deserted his brother, who was obliged to sustain alone an unequal conflict. His great courage and conduct, after a long and doubtful contest, procured him the victory, and the insurgents submitted (770). This contest convinced Charlemagne of the necessity of repressing the nobles and employing them thenceforward in important enterprises, in order to divert their attention from the internal affairs of the empire. Had he not, therefore, himself been inclined to wars of conquest, in which his talents could be exhibited in all their splendour, he would have been induced to undertake them by the internal condition of the empire. At Carloman's death in 771, and after the flight of his wife and her two sons to her father in Italy, Charlemagne made himself master of the whole empire, the extent of which was already very great, as it embraced, besides France, a large part of Germany. He now formed the plan of conquering the Saxons, for which his zeal for the diffusion of Christianity served him as a pretence. The Saxons, a nation of German heathens, were in possession of Holstein and Westphalia, between the rivers Weser and Elbe, and preferred pillaging to peaceful occupations, and a wandering to a settled mode of life. An irruption into the territory of the Franks was the alleged cause of the first war which Charlemagne began against them in 772. The other wars were produced by the rebellions of this warlike nation, which was never reduced to complete submission till the peace of Seltz, in 803, after it had embraced Christianity. A part of the Saxons Charlemagne removed to Flanders and Switzerland, and their seats were occupied by the Obotrites, a Vandal tribe in Mecklenburg. The famous pillars called *Irminsäulen* were destroyed as monuments of pagan worship. During thirty-two years did the Saxons resist a conqueror who, striving with equal eagerness to convert and to subdue them, never became master of their country till he had transformed it almost into a desert. They might have made a more successful defence had they not been distracted by internal dissensions. The most celebrated of their leaders was Wittikind, and next to him Albio, who finally embraced Christianity in 783. To explain the protracted resistance of the Saxons, we must remember that the troops were levied only for one campaign, which produced an armistice every year; that Charlemagne was obliged to wage wars at the same time against the Lombards, the Avars, the Saracens, and the Danes; and that the magnitude of his states facilitated the rebellions of his vassals, on which account all his attention was often required to preserve internal tranquillity.

While he was combating the Saxons on the banks of the Weser Pope Adrian implored his assistance against Desiderius, who had torn from him the exarchate of Ravenna, which Pepin the Short had presented to the holy see, and who was urging the pope to crown the nephews of Charlemagne, that Charlemagne himself might be considered a usurper. Charlemagne immediately left Germany and marched with his army to Italy. Desiderius fled to Pavia, which was bravely defended by the Lombards. The city finally fell, and Desiderius, with the widow and sons of Carloman, were carried prisoners to France. Desiderius ended his life in a monastery. Respecting the fate of the others history is silent. In 774 Charlemagne was crowned King of Lombardy with the iron crown. Although this kingdom was now a dependency, the provinces of which it consisted were allowed to retain their former laws and constitutions, it being a general maxim of the great monarch not to deprive the conquered nations of their usages and laws, nor to govern them all under one form. In this he followed the dictates of sound policy, which led him to beware of consolidating all his vassals into a political body with equal rights, which might render a general combination against their ruler practicable.

In 778 he repaired to Spain to assist a Moorish prince. He conquered Pampeluna, made himself master of the county of Barcelona, and spread the terror of his name everywhere. But on his return his troops were surprised in the valley of Roncesvalles by some Saracens, in connection with the mountaineers (the Basques), and the rear-guard defeated; remarkable from the circumstance that Roland, one of the most famous warriors of those times, fell in the battle. (See Roncesvalles.) The disaffection of the tribes of Aquitania induced Charlemagne to give them a separate ruler: for this purpose he selected the youngest of his sons, Louis (called *le Débonnaire*). The Lombards were no less turbulent, and the Greeks made incessant efforts to reconquer Italy; and the nobles, to whom he had intrusted a part of the sovereignty of this country, evinced little fidelity. He therefore gave them his second son, Pepin, for a monarch; his eldest son, Charles, remaining constantly with him, and assisting him in his manifold undertakings. In 781 he caused these two sons to be crowned by the pope in Rome, hoping to render the royal dignity inviolable in the sight of the people. Charlemagne had another son, also called Pepin, who was the oldest of all his children, being the son of his divorced wife. This circumstance probably inspired the monarch with an aversion to the elder Pepin, and prevented him from admitting him to a share in the government.

After returning from Spain Charlemagne was again obliged to take the field against the Saxons. Exasperated by the defeat of his generals in 782, he caused 4500 Saxons to be massacred at Verdun —a measure which urged to fury the hatred of the people. The year 790, the twenty-second of his reign, was the only one which he passed without taking up arms. As his power increased, he meditated more seriously the accomplishment of the plan of his ancestor, Charles Martel, to restore the Western Empire. To prevent the partition of the empire, the Empress Irene, who then reigned at Constantinople, proposed to Charlemagne to marry their children, by which means the world would again have been united under one dominion. Her proposition was accepted; but Irene's ambition carried her so far that she dethroned her own son to render herself supreme, and offered her own hand to Charlemagne, who did not seem averse to the union; but Irene herself was deposed, and the marriage never took place. On Christmas-day (800) he was proclaimed Cæsar and Augustus by Pope Leo III.; he was invested with the ornaments of the ancient Roman emperors, and the only thing forgotten was, that the empire could not subsist long in a family where the authority was, by law, divided among the children of the deceased monarch. Pepin, king of Italy, died in 810, and his death was followed the next year by that of Charles, the eldest. Thus of his legitimate sons one only remained, Louis, king of Aquitania, whom Charlemagne adopted as his colleague in 813, as his age and increasing weakness gave him warning that the end of his life could not be far distant. He died Jan. 28, 814, in the seventy-first year of his age and the forty-seventh of his reign, with anticipations and fears that his empire would not long withstand the attacks of foreign enemies—apprehensions which the event confirmed. Charlemagne was buried at Aix-la-Chapelle, his favourite and usual place of residence. He was deposited in a vault, where he was placed on a throne of gold, in full imperial costume. The sepulchre was sealed, and over it was erected a kind of triumphal arch, on which were the words, 'Here lies the body of Charles, the great and orthodox emperor, who gloriously enlarged, and for forty-seven years happily governed, the empire of the Franks.'

Charlemagne was a friend of learning; he deserves the name of restorer of the sciences and teacher of his people. He attracted by his liberality the most distinguished scholars to his court; among others, Alcuin, from England, whom he chose for his own instructor; Peter of Pisa, who received the title of his grammarian; and Paul Warnefried, better known under the name of *Paulus Diaconus*, who gave the emperor instruction in Greek and Latin literature. By Alcuin's advice, Charlemagne established an academy in his palace at Aix-la-Chapelle the sittings of which he attended with all the scientific and literary men of his court—Leidrades, Theodulphus, the Archbishops of Trèves and Mentz, and the Abbot of Corvey. All the members of this academy assumed names characteristic of their talents or inclinations. One was called *Damœtas*, another *Homer*, another *Candidus;* Charlemagne himself took the name of *David.* From Italy he invited teachers of the languages and mathematics, and established them in the principal cities of his empire. In the cathedrals and monasteries he founded schools of theology and the liberal sciences. He strove assiduously to cultivate his mind by intercourse with scholars; and, to the time of his death, this intercourse remained his favourite recreation. His mother-tongue was a form of the Teutonic, but he spoke several languages readily, especially the Latin. He was less successful in writing, because he had not applied himself to it till he was further advanced in years. In the winter he read much, and even caused a person to read to him while he took his meals. He endeavoured to improve the liturgy and church music. He was desirous of introducing the Roman liturgy into his states; but the clergy, who clung to the ancient usages, offered some resistance. Several churches, however, complied with the wish of the monarch, and others mingled the Roman and Gallican liturgy. He attempted to introduce uniformity of measures and weights, but was unable to accomplish his design. Another great plan of his was to unite the Rhine with the Danube, and consequently the Atlantic with the Black Sea, by means of a canal. The whole army was employed on the work; but its accomplishment was prevented by the want of that knowledge of hydraulic architecture which has been since acquired. The arts, however, under his patronage, produced other monuments of his fame. The city of Aix-la-Chapelle received its name from a splendid chapel which he caused to be built of the most beautiful Italian marble. The doors of this temple were of bronze, and its dome bore a globe of massive gold. The imperial palace was built in the highest style of splendour. Charlemagne also erected baths, in which more than one hundred persons could swim in warm water. He was himself very fond of swimming, and frequently used these baths, with all the nobles of his court, and even with his soldiers. At Seltz, in Alsace, he had a no less splendid palace. To Charlemagne France is indebted for its first advances in navigation. He built the light-house at Boulogne, and constructed several ports. He encouraged agriculture, and made himself immortal by the wisdom of his laws. Thus his law *de villis* is esteemed a monument of his views on rural economy His fame filled even the East. He received ambassadors from the patriarch of Jerusalem, from the Emperors Nicephorus and Michael, and was twice complimented with embassies from Haroun al Raschid, the famous caliph of Bagdad, all of which he received with a splendour unexampled even in the East. He convened councils and parliaments, published capitularies, wrote many letters (some of which are still extant), a grammar, and several Latin poems. His empire comprehended France, most of Catalonia, Navarre, and Arragon; the Netherlands, Germany as far as the Elbe, Saale, and Eyder, Upper and Middle Italy, Istria, and a part of Sclavonia.

In private life Charlemagne was exceedingly amiable: a good father and generous friend. His domestic economy afforded a model of frugality; his person, a rare example of simplicity and greatness. He despised extravagance of dress in men, though, on solemn occasions, he appeared in all the splendour of majesty. His table was very plain. His only excess was his love of the other sex. He was large and strong; his height, according to Eginhard, equalled seven times the length of his foot. His head was round; his eye large and lively; his nose of more than common size; his countenance had an agreeable expression of serenity. His gait was firm; his bearing manly. He enjoyed perfect health till the last four years of his life, when he was attacked by fevers, and began to limp. In summer he was accustomed to repose for two hours after dinner, but at night he slept uneasily. He wore the dress of his country; on his body a linen shirt, over which was a coat with a silk border, and long breeches. For his outer dress he wore a cloak, and always his sword, the hilt and belt of which were of gold and silver. He possessed a natural, impressive eloquence, and in his expression of countenance there was something to excite respect, united with gentleness and kindness. See Eginhard.

CHARLEMONT AND GIVET, one of the strongest fortresses in France, in the department of the Ardennes, with 10,000 inhabitants. The works occupy both banks of the Meuse, about 25 miles above Namur, at the junction of several roads, on a steep mountain. The two places completely command the river. The castle and small town of Charlemont were built in 1555 by Charles V. Louis XIV. enlarged it by fortifying the small town of Givet, which lies at the foot of the hill, and by increasing the fortifications of Charlemont. At present the place consists of four fortresses, two of which, Charlemont and Great Givet, lie on the left bank of the Meuse, and the other two, Little Givet and Mont d'Haur, upon the right. Charlemont rises from a narrow rock, which is 700 feet high, commands almost every direction, descends perpendicularly towards the Meuse and the west side, on the north is very steep, and descends with a gentle slope on the east. This last side, the only one on which an attack can be apprehended, is defended by six bastions, a horn and a crown work, and several detached works. Almost all the moats are hewn in the rock, and well provided with casemates. Great Givet has four bastions and three ravelins with dry ditches. Little Givet contains four bastions and full ditches, but no covered way; and Mont d'Haur, a hill opposite to Charlemont, is included within the lines of the fortress by a strong crown-work, and may, at the same time, serve as a fortified camp. The fortress is calculated for a garrison of 11,000 men, but in case of necessity can contain 25,000, and may be defended by 3000 to 4000 men. Though the two Givets and Mont d'Haur would not offer great obstacles to an attack, yet Charlemont is almost impregnable. The Prussians contemplated assailing it in 1815, but abandoned the design, although the Givets and Mont d'Haur had already capitulated.

CHARLEROI, a town in Belgium, province of Hainaut, on both sides of the river Sambre, 20 miles E.N.E. Mons, the low town standing on the right and the middle town and high town on the left bank. The only public building deserving notice is the parish church, which is handsome, and was built by Louis XIV. Charleroi possesses a college, an academy of design, an hospital, and primary and other schools. It stands in a densely populated district with productive coal and iron mines, which have given rise to flourishing industries; it may be considered the centre of the Belgian iron trade. It was taken by the French, under General Valence, in the month of November, 1792, with 4000 prisoners. It was recovered by the Austrians, in the month of June, 1793, when the French were twice defeated; once with the loss of 4000 men, and again of 7000. July 25, 1794, it again surrendered to the French at discretion, with the garrison of 3000 men and sixty pieces of cannon. Pop. (1898), 24,310.

CHARLES; the name of many important personages, whose lives are here given or referred to, in the following order:—

	Page
Charles I., king of France,	247
Charles II., ,,	247
Charles III., ,,	247
Charles IV., ,,	248
Charles V., ,,	248
Charles VI., ,,	248
Charles VII., ,,	248
Charles VIII., ,,	249
Charles IX., ,,	249
Charles X., ,,	250
Charles IV., emperor of Germany,	250
Charles V., ,,	251
Charles VI., ,,	253
Charles VII., ,,	254
Charles I., king of England.	254
Charles II., ,,	256
Charles XII., king of Sweden,	258
Charles XIII., ,,	260
Charles IV., king of Spain,	260
Charles, archduke of Austria,	260
Charles Albert, king of Sardinia,	261
Charles Edward Stuart (Prince),	261
Charles Emanuel I., duke of Savoy,	261
Charles Martel,	262
Charles the Bold, duke of Burgundy,	262

CHARLES I., surnamed *le Chauve*, or *the Bald*, King of France, was son of Louis le Débonnaire by his second wife Judith, and was born at Frankfort-on-the-Maine, on 13th June, 823. He was invested by his father with the kingdoms of Alemania, Burgundy, Provence, and Septimania, and subsequently with that of Aquitaine. On Louis's death in 840, Charles found himself confronted with two enemies—his half-brother Lothaire, who, as eldest son, claimed the whole of the Frank empire of Charlemagne, and his nephew Pepin, who asserted, in right of his father, a preferable claim to the sovereignty of Aquitaine. After considerable bloodshed, a treaty was entered into between Charles and Lothaire at Verdun, by which the former received, as his share of the dominions of Charlemagne, all those territories comprehended between the ocean on the one part, and the Meuse, the Scheldt, the Saône, the Rhone, and the Mediterranean, on the other. His struggle with Pepin was long and obstinate, and in 844 he was obliged to recognize him as King of Southern Aquitaine. In 875, by the death of his nephew, the Emperor Louis II., he gained possession of the imperial crown, and thereby provoked the hostility of his brother, Louis the German, who ravaged the territory of Champagne, and otherwise committed great havoc in his dominions. In 877 he proceeded to Italy on a crusade against the Saracens, to which he had been summoned by the pope, but died when crossing Mount Cenis. His death was groundlessly attributed to poison, said to have been administered to him by a Jewish physician. He was succeeded on the French throne by his son, Louis the Stammerer.

CHARLES II., surnamed *le Gros*, or *the Fat*, King of France, is also known as Charles III., emperor of Germany, and was born about 832. He was the son of Louis the German, and the grandson of Louis le Débonnaire, and was recognized as Emperor of Germany by the Pope. In 885 he ascended the French throne, to the prejudice of his cousin, Charles the Simple, whose youth prevented him from asserting his rights: but in 887 was deposed, and the following year died miserably at the abbey of Reichenau, in Swabia, strangled, as is asserted, by his servants.

CHARLES III., surnamed *the Simple*, King of France, was the posthumous son of Louis the Stammerer, and born on 17th September, 879. On his father's death France was divided between Charles's two brothers, Louis III. and Carloman, and an aristocratic oligarchy. On the death of his brothers he ought in right to have ascended the throne, but his extreme youth prevented his claims being recognized, and his cousin, Charles the Fat, was proclaimed king in 885. On the deposition of the latter in 887 Count

Eudes of Paris succeeded in obtaining the crown; but a combination being formed in favour of Charles, Eudes found himself so hard pressed as to be obliged to cede to the former the whole of the north of France; and his death three years afterwards, in 898, left Charles undisputed king of the whole country. The reign of Charles is chiefly noted for the piratical incursions of the Northmen or Normans, who ravaged the coasts of France, sailed up the principal rivers, and spread such dismay and confusion, that, to conciliate them and put an end to their devastations, he agreed to cede to their chief Rollo the territory of Normandy, to be held as a fief of the French crown. Latterly also Charles' tranquillity was much disturbed by the turbulence of some of his great vassals, who broke into open rebellion, declared the throne forfeited, and proclaimed as king Robert, brother of Count Eudes. Through the treachery of Herbert, count of Vermandois, Charles was inveigled into the town and imprisoned in the fortress of Peronne. From this he was only liberated a short time before his death in 929. By his second wife, Ogiva of England, he was the father of Louis d'outre-Mer, whom a reaction in favour of the Carlovingian dynasty placed on the throne in 936.

CHARLES IV., surnamed *le Bel*, or *the Handsome*, King of France, third son of Philippe le Bel, was born in 1294, and in virtue of the salic law ascended the throne in 1322, to the exclusion of the daughters of Philip the Long. He reigned six years, and died in 1328, without male issue, and was the last of the direct line descended from Hugh Capet. Isabella his sister married Edward II. of England, and was materially aided by Charles in fitting out, along with her paramour Mortimer, the expedition which resulted in the dethronement of her husband.

CHARLES V., surnamed *the Wise*, King of France, was the son of King John and Bona of Luxemburg, and born at Vincennes on 21st January, 1337. While Duke of Normandy, and during the captivity of his father in England, after the battle of Poitiers, he took the title of lieutenant of the kingdom. At this period France was in a miserable condition, the result partly of the continued wars which she had to maintain with England, and partly also of the unlimited violence and oppression exercised over the lower orders by the nobility. The vices and extravagance of the court were also extreme, and the demands of the states-general for reform, headed by Stephen Marcel, provost of the merchants of Paris, were loudly and persistently urged. This assembly was supported in its claims by Charles the Bad, king of Navarre, who, as grandson of Louis le Hutin, maintained a preferable right to the crown. By artfully temporizing Charles contrived to detach the leading orders from the cause of the states, and having brought about indirectly the assassination of Marcel, succeeded in crushing their party. Meantime his father John still continued in captivity in England till liberated by the Treaty of Brétigny in 1360. Four years afterwards he died, leaving Charles as his successor to the French crown. The reign of the latter presents a series of combined hostilities and intrigues carried on with the view of establishing his power and extending his dominions. In these he was so far successful as to keep at bay the King of Navarre and deprive the English of a great part of their possessions in France. He died on 16th September, 1380. The magnanimity and wisdom of Charles have been greatly commended by some writers, and if we make due allowance for the times in which he lived, the high character which these have assigned him may not appear overcharged. That in his public administration, however, he was guilty of various acts of perfidy and cruelty cannot be disputed. He possessed some literary tastes, and was the founder of the Bibliothèque Royale. A less beneficial act was the erection of the Bastille, for the purpose of overawing the Parisians, whose outbreaks he had found reason to dread.

CHARLES VI., surnamed *the Silly*, King of France, and son of the foregoing, was born at Paris on 3d December, 1368. When his father died he was not twelve years old, and the contending pretensions of his uncles, the Dukes of Anjou, Berry, Burgundy, and Bourbon, rendered his minority a scene of unbounded turbulence and license. In 1385 he was married at Amiens to Isabella of Bavaria, who was then only fourteen years of age. In 1388 he declared himself independent of guardians, and took the reins of government into his own hands. His mild and amiable, though somewhat dissipated character, had already secured for him a considerable share of popularity, when he was overtaken by a fearful calamity, the loss of his reason—a condition in which, with a few lucid intervals, he remained to the end of his days. The origin of this was constitutional, aggravated by a fright and a severe accident. Perhaps at no period in her history was France the scene of greater disasters and miseries than during the reign of this unhappy prince. The rival factions of the Burgundians and the Armagnacs, the former headed by the Duke of Burgundy, the latter by the Duke of Orleans, with whom Queen Isabella had formed a criminal connection, kept up constantly throughout the country the horrors of a most rancorous civil war; while brigandage and every kind of violence prevailed to the most fearful extent. Such a conjunction afforded the most favourable opportunity for an invader; and accordingly, in 1415, Henry V. of England crossed over to Normandy with a numerous army, took Harfleur by storm, and signally defeated the French forces in the battle of Agincourt. Improving these advantages he advanced into the country, gained possession of the capital, and compelled the crazy king to sign the Treaty of Troyes, by which his daughter Catharine was given in marriage to Henry, and the latter acknowledged successor to the French crown after Charles's death. Neither monarch long survived this celebrated paction, both dying within a few months of each other, Henry on 31st August, and Charles on 21st October, 1422.

CHARLES VII., King of France, was born at Paris on 22d February, 1403, and though only the fifth son of Charles VI. and Isabella of Bavaria, became, by the successive deaths of his elder brothers, dauphin and heir-presumptive to the crown. That he should ever succeed to it was then extremely problematical, as Henry V. of England was pursuing his career of conquest, and shortly afterwards, by the Treaty of Troyes, secured to himself the hand of Charles' sister Catherine, and the succession to the French throne after her father's death. In the treacherous murder of the Duke of Burgundy at the bridge of Montereau Charles was actively implicated. On the King of England's death in 1422 his son Henry VI. was proclaimed king of France at Paris. The war with the national party, represented by the Orleanist faction, with the dauphin at their head, was maintained for several years by the English, under the command of the Duke of Bedford. So successfully did the latter conduct operations that Charles was brought to the verge of despair, and almost reduced to abandon the struggle as hopeless, when his fortunes were retrieved by one of the most singular incidents recorded in history. This was the arrival in his camp of the maid of Orleans, who by the enthusiasm which she inspired first turned the tide of success against the English. (See Joan of Arc.) The fresh spirit thus infused into the breasts of the French was heightened by mismanagement on the part of the English, whose military operations were conducted with greatly diminished efficiency after the death of the Duke of Bedford, while discord and confusion prevailed in the home councils. Through the intervention of the Earl of Suffolk a marriage was concluded between the young King Henry VI. and Margaret of Anjou, niece of Charles VII.'s queen. In the treaty entered into on this occasion the territory of Maine was secretly surrendered to France, and subsequently, on hostilities being resumed between the two countries, the troops of Charles conquered the whole of Guienne, and finally expelled the English from all their possessions in France except Calais. The last years of Charles' reign were embittered by domestic broils, in which his son and successor Louis XI. took a prominent part against his father. So hemmed in at last was the latter by the emissaries of the dauphin that he conceived the idea of Louis having formed a deliberate plan to poison him; and so firmly was this notion rooted in his mind that he could only with the greatest difficulty be induced to take any food. It was too late, however, to remedy the mischief occasioned by this protracted abstinence, and he died at the castle of Mehun, near Bourges, on 22d July, 1461. A romantic interest has been thrown round Charles VII. by his early reverses and the re-establishment of French nationality, which he effected mainly through the heroism inspired by the maid of Orleans. His personal character, however, was weak and contemptible, without energy and without principle, surrendering himself continually to sensual and degrading pleasures. His share in the treacherous murder of the Duke of Burgundy, and base abandonment to her fate of Joan of Arc, are stains on his memory which cannot be effaced.

CHARLES VIII., King of France, son of Louis XI., was born at Amboise on 30th June, 1470, and succeeded his father in 1483, his sister Anne de Beaujeu acting as regent till he attained the age of twenty. In 1491 he married Anne, the heiress of Brittany, and thereby annexed that important duchy to the French crown. By so doing, however, he both broke faith with the daughter of Maximilian, king of the Romans, to whom he had been espoused, and also robbed Maximilian of his bride, a marriage by proxy having been already concluded between him and Anne. The leading incident of Charles VIII.'s reign is his Italian expedition and conquest of the Kingdom of Naples, having been instigated thereto by Ludovico Sforza, the usurping duke of Milan. The title pretended to Naples was asserted in virtue of the rights to that sovereignty transmitted by the house of Anjou to the royal family of France. The whole of Charles' expedition reads like a page from one of the old chivalrous romances. With an army of 30,000 men, unprovided either with money or stores, he suddenly crossed the Alps, advanced rapidly southwards, and meeting with scarcely any obstruction, arrived before the walls and gained possession of Naples. This conquest, however, he did not retain for many months. Having left 5000 men to guard his new acquisition he returned to France, and had scarcely reached it when the arms of Gonsalvo de Cordova effected the re-annexation of Naples to Spain. The expedition of Charles VIII. left thus hardly a trace upon the country, but is memorable as the commencement of that series of French incursions into Italy which, under his successors, deluged that fair land with bloodshed. He was meditating a renewed descent into Italy when he died at Amboise on 7th April, 1498. He left no children, and was succeeded by his relative the Duke of Orleans under the title of Louis XII.

CHARLES IX., King of France, son of Henry II. and Catharine de' Medici, born in 1550 at St. Germain-en-Laye, ascended the throne at the age of ten years, after the death of his brother Francis II. No regency was appointed, and it was deemed sufficient to write to the parliament, through the young prince, that he had requested his mother to undertake the administration of the public affairs. The parliament acquiesced in this resolution, to avoid exciting new contests between the Guises and the princes of the blood. Catharine consented that the King of Navarre should be appointed governor-general of the realm, as she was too well aware of the weakness of his character to fear him. In order to gratify her ambition, she resolved to throw everything into confusion. (See Catharine de' Medici.)—The Guises soon saw that they must oppose a Catholic league to the political associations of the Calvinists. (See Guise.)—The cruel persecutions against the Huguenots now broke out. (See Bartholomew's Day, St.)—The Duke of Guise, who obtained possession of the person of the young king, was shot by an assassin before Orleans, in February, 1563. In his last moments he advised the king and the queen-mother to negotiate with the parties. This advice was followed; a treaty was signed March 19, and Havre was taken from the English July 27. The king, who was the same year declared of age, visited the provinces in company with his mother. At Bayonne he had a meeting with his sister Isabella, the wife of Philip II. of Spain. This excited such suspicions in the Calvinists that they took up arms, and immediately formed the plan of attacking the king on his return to Paris. Being warned in season he escaped the danger; but this plot could not fail to arouse the hatred of Charles, who was proud by nature, and more to be pitied than blamed for his too great confidence in his artful mother. After the battle of St. Denis, 1567, in which the constable of Montmorenci lost his life, Catharine entered into negotiations for peace. But the Calvinists reserved a part of the places which they were to have surrendered, and continued to keep up a communication with England and the German princes. A new civil war soon broke out. Notwithstanding the jealousy of Charles Catharine placed the Duke of Anjou at the head of the royal army. The Prince of Condé having been shot in the battle of Jarnac in 1569, and the Admiral Coligny having been defeated at Montcontour in the same year, the king concluded peace, in 1570, on terms which were so favourable to the Calvinists that they seem even to have suspected treachery under them. The heads of that party did not therefore all appear at court when Charles celebrated his marriage with Elizabeth, the daughter of Maximilian II. By degrees this distrust disappeared, and the marriage of the young King of Navarre (afterwards Henry IV.) with Margaret, sister of Charles X., seemed to banish every suspicion. This marriage took place August 18, 1572. On the 22d the first attempt was made on the life of Coligny, and on the 24th began that massacre known under the name of the *massacre of St. Bartholomew's*, from having taken place on the night of the festival of that saint. Civil war broke out for the fourth time, and Catharine now became aware of the errors of her policy. Charles could no longer conceal his aversion to her, and was on the point of assuming himself the reins of government, when he died, childless, in 1574. He was succeeded by his brother Henry III. Charles was impetuous and ambitious; had his character sapped by the infamous policy of his mother, who surrounded him with temptations of the most effectual kind; yet possessed in some measure a taste for literature and art, and a good-natured kind of condescension, which covers many royal faults.

CHARLES X., COMTE D'ARTOIS, King of France, born at Versailles in 1757, grandson of Louis XV., was the youngest son of the dauphin, and brother of Louis XVI. He spent a dissipated youth, and when the revolutionary period commenced took a decided part in opposing every tendency to change and innovation. He left France in 1789, after the first popular insurrection and destruction of the Bastille, and at Pilnitz attended the congress of princes, for the purpose of opposing the spread of revolutionary principles. After Louis XVI. had accepted the constitution of 1791, he invited him to return to France, but he refused, and the legislative assembly, after stopping his allowance on the civil list, confiscated his property in 1792. He afterwards assumed the command of a body of emigrants, and acted in concert with the Austrian and Prussian armies on the Rhine. At a later period he made a descent on the coast of Brittany, but despairing of success, retreated to Great Britain, and resided for several years in the palace of Holyrood at Edinburgh. After the downfall of Napoleon he entered France with the title of lieutenant-general of the kingdom, and issued a judicious proclamation, promising the reign of law and an entire oblivion of the past. In 1824 he succeeded his brother, Louis XVIII., under the title of Charles X., and gained a momentary popularity by the abolition of the censorship of the press, but measures of a very different description soon followed, and the spirit of disaffection was so widely spread that a collision with the popular party became inevitable. Charles X. endeavoured to gain the start by what is called a *coup d'etat*, and issued his celebrated ordonnances, but victory declared against him, and he was ignominiously driven from the throne in 1830. After formally abdicating in favour of his grandson, the Duke de Bordeaux, he revisited England, resumed his residence for a short time at Holyrood, and finally settled at Göritz in Styria, where he died of cholera in 1836.

CHARLES IV., Emperor of Germany, of the house of Luxemburg, was born in 1316. The quarrels of the Emperor Louis the Bavarian with the King of Bohemia, the father of Charles, the choice of the latter, in the room of the emperor, excommunicated by Clement VI., and the victory which Louis, far his superior in power and talents, obtained over his rival, we have not room to relate. After the death of Louis, October 21, 1347, Charles of Luxemburg, who inherited the Kingdom of Bohemia, and had been chosen emperor in 1346 by five electors, hoped to occupy the imperial throne without opposition. But the princes of the empire regarded him as a servant of the pope. Ten years had not yet elapsed since Germany, at the diet of Rense, had adopted the most energetic measures against the claims of the holy see. The election of Charles IV. was the first infringement of the celebrated constitution of 1338. In consequence the Archbishop of Mentz, whom Clement IV. had deposed, the electors of Brandenburg and the palatinate, the Duke of Saxe-Lauenburg, who arrogated a vote in the election, assembled at Lahnstein, declared the choice of Charles to be void, and elected Edward III. of England; but this monarch, then at war with France, made use of the offer of the electors so far only as to secure the neutrality of the King of Bohemia, and rejected the proffered crown. Equally fruitless was the choice of Frederick the Severe, landgrave of Meissen; upon which the enemies of Charles elected the virtuous and heroic Count Gunther of Schwarzburg, whom Charles is said to have poisoned. Those who surrounded Gunther in his last moments extorted from him an abdication, for which they were munificently paid by Charles. He now used every effort to appease his enemies. He married the daughter of the Elector of the Palatinate, gave Tyrol as a fief to the Elector of Brandenburg, and was unanimously elected emperor, and consecrated at Aix-la-Chapelle. But no sooner was he crowned than he took possession of the imperial insignia, and conveyed them to Bohemia. He persuaded the Elector of the Palatinate to subject a great portion of the upper palatinate to the feudal court of Bohemia. This tribunal, which he regarded as the most proper instrument for the subjugation of Germany, was enlarged in its jurisdiction more and more. In 1354 the emperor went to Italy to be crowned by the pope; but this favour he purchased on terms which made him an object of ridicule and contempt. He engaged to appear without any armed force. Having been consecrated King of Italy at Milan, he confirmed the Visconti in the possession of all the usurpations of which he had promised to deprive them. He also annulled all the acts of his grandfather, Henry VII., against Florence, and by a treaty concluded at Padua resigned the latter city, with Verona and Vicenza, to Venice. He refused the request of some Romans to claim the city, as belonging to him in the name of the empire, and in a treaty renounced all sovereignty over Rome, the States of the Church, Ferrara, Naples, Sicily, Sardinia, and Corsica, and even took an oath not to return to Italy without the consent of the pope. Despised by the Guelphs, detested by the Ghibellines, Charles returned to Germany, where he issued the celebrated golden bull, which, till modern times, continued a fundamental law of the German Empire. (See BULL.) He thus acquired some claims to the public gratitude: but these were soon effaced by the general indignation, excited by the proposal made, with his consent, by the Papal nuncio, to introduce a tax, equal to the tithe of all ecclesiastical revenues, for the benefit of the holy see. All the members of the diet opposed it; and Charles, in his anxiety to conciliate the princes of the empire, announced that he would propose to the assembly a reform of the German clergy. The pope, enraged at this proposal of the emperor, exhorted the electors to depose him. Charles immediately relapsed into his accustomed submissiveness, and not only abandoned all his reforms, but even confirmed, in 1359, all the privileges of the clergy, all their present and future possessions, and made them independent of the secular power. Such vacillating conduct subjected him to the contempt of both parties, of which he received a proof before the close of the same diet, which was held at Mentz. Several princes had, by degrees, obtained possession of many territories formerly fiefs of the empire. Charles attempted to reunite them with the empire; but the dissatisfaction which was manifested at the attempt frustrated this plan, and he indemnified himself by selling to the King of Poland the rights of sovereignty, which had been hitherto exercised by the German emperors, over some of his provinces. Under such an emperor Germany could not enjoy internal tranquillity. Bands of robbers plundered the country in all quarters. The emperor left the princes and cities to protect themselves by mutual alliances. The state of Italy was no less melancholy. Tuscany was suffering the evils of anarchy; Lombardy was distracted by civil wars, and the Visconti had made themselves masters of the Milanese. The emperor, true to his principle of sanctioning power wherever found, appointed these usurpers his vicars-general in Lombardy. Emboldened by this, Barnabas Visconti threatened to subject all Italy to his yoke. Pope Urban V., having requested Charles to concert measures of resistance with him, hastened from Avignon to Rome, concluded several alliances, levied troops, and waited for the emperor, who actually appeared with a considerable force. Charles took advantage of the pope's situation to persuade him to crown his fourth wife, Elizabeth of Pomerania, at Rome, and, in return, entered into the most positive engagements with Urban. Notwithstanding this he again engaged in negotiations with the Visconti, and sold them a formal confirmation of all their usurpations. In like manner, during his residence in Italy, he sold states and cities to the highest bidder, or, if they themselves offered most, made them independent republics. With great treasures he returned to Germany. Gregory XI. having given his consent that his son Wenceslaus should be elected king of the Romans, he employed his ill-gotten wealth to purchase the votes of the electors, who were irritated at the conduct of the pope, and, moreover, distributed among them the domains of the empire on the Rhine, and several free imperial cities. Thus he attained his object. To maintain their rights against the arbitrary measures of the emperor, the imperial cities in Suabia formed the *Suabian league*, which Charles opposed in vain. The empire was nearly ruined when Charles died at Prague in 1378. To his eldest son, Wenceslaus, he left Bohemia and Silesia; to the second, Sigismund, the electorate of Brandenburg; and to the third, Lusatia. His reign is remarkable for the improvement and prosperity of Bohemia; for the founding of the Universities of Prague and Vienna; for a terrible persecution of the Jews, and as the period when the sale of letters of nobility commenced in Germany.

CHARLES V., Emperor of Germany and King of Spain (in the latter capacity he is called Charles I.), the eldest son of Philip, archduke of Austria, and of Joanna, the daughter of Ferdinand and Isabella of Spain, was born at Ghent, Feb. 24, 1500. Philip was the son of the Emperor Maximilian and Mary, daughter of Charles the Bold, last duke of Burgundy. Charles' birth gave him claim to the fairest countries of Europe. He was educated in the Netherlands under the care of William of Croy, lord of Chièvres. Charles preferred military exercises to study. Chièvres, without diverting him from his favourite occupations, taught him history, formed him for affairs of state, and gave him that gravity of manner which he retained through life. After the death of Ferdinand his grandfather, in 1516, Charles assumed the title of King of Spain. The management of this kingdom was intrusted to the celebrated Cardinal Ximenes, who by his genius prepared the way for the glorious reign of Charles V. In 1519 Charles, on the death of Maximilian, was elected emperor. He left Spain to take possession of his new dignity, for which he had to contend with Francis I., king of France. His coronation took place at Aix-la-Chapelle with extraordinary splendour. The elective capitulation (see CAPITULATION) signed by his ambassadors he ratified without hesitation. Its leading features were the reservations made by the electors securing themselves against foreign influence. The emperor was not to begin any war without their consent; no language but the German or Latin was to be used in the administration of the affairs of the empire; and the rich commercial confederacies of merchants, whose wealth had enabled them to act according to their own will, were to be abolished by the emperor, assisted by the advice of the members of the empire. The association aimed at was the powerful Hanseatic League, whose influence had excited the electors' jealousy. The progress of the Reformation in Germany demanded the care of the new emperor, who held a diet at Worms. Luther, who appeared at this diet with a safe conduct from Charles, defended his cause with energy and boldness. The emperor kept silent; but after Luther's departure a severe edict appeared against him in the name of Charles, who thought it his interest to declare himself the defender of the Roman Church. The claims which Francis I. had advanced to the empire, and those which he still preferred to Italy, the Netherlands, and Navarre, made war inevitable. Charles prepared for it by an alliance with the pope. Hostilities broke out in 1521. The French, victorious beyond the Pyrenees, were unsuccessful in the Netherlands. A congress held at Calais only increased the irritation, and gave Henry VIII., king of England, a pretext for declaring himself for Charles, whose party daily acquired strength. A serious insurrection in Spain was happily subdued. The defeat of Bonnivet in the Milanese, and the accession of the Constable of Bourbon, indemnified Charles V. for his want of success in Provence. Francis, who was besieging Pavia, was defeated by the imperial forces and taken prisoner in 1525. On this occasion Charles feigned the moderation of a Christian hero. Without improving his advantages he remained inactive in Spain. But he thought to attain his object in another way. He proposed to Francis I. such hard conditions that this unfortunate prince swore that he would die in captivity rather than accede to them. Meanwhile he was carried to Spain, and treated with respect. Charles, however, did not visit him until he was informed that the life of his prisoner was in danger. The interview was brief. Charles promised his captive a speedy release. The Treaty of Madrid was finally concluded in Jan. 1526.

The power of Charles now became a source of uneasiness to most other princes of Europe. Pope Clement VII. placed himself at the head of a league of the principal states of Italy against the emperor, but their ill-directed efforts were productive of new misfortunes. Rome was taken by storm by the troops of the Constable of Bourbon, sacked, and the pope himself made prisoner. Charles V. publicly disavowed the proceedings of the Constable, went into mourning with his court, and carried his hypocrisy so far as to order prayers for the deliverance of the pope. On restoring the holy father to liberty he demanded a ransom of 400,000 crowns of gold, but was satisfied with a quarter of that sum. He also released, for 2,000,000, the French princes who had been given to him as hostages. Henry VIII. of England now allied himself with the French monarch against Charles, who accused Francis of having broken his word. The war was terminated in 1529 by the Treaty of Cambray, of which the conditions were favourable to the emperor. Charles soon after left Spain, and was crowned in Bologna as King of Lombardy and Roman Emperor. In 1530 he seemed desirous, at the Diet of Augsburg, to reconcile the various parties; but not succeeding, he issued a decree against the Protestants, which they met by the Schmalkaldic League. He also published, in 1532, a law of criminal procedure (see CAROLINA). Notwithstanding his undertakings in favour of the Catholic religion, Charles always practised moderation towards the Protestants whenever his interest left room for toleration. Nor did the Protestant princes hesitate to furnish their contingents when he was assembling an army against the Turks. Having compelled Solyman to retreat, he undertook, in 1535, an expedition against Tunis, reinstated the dey, and released 20,000 Christian slaves. This success added to his character somewhat of the chivalric, which gave him still more influence in Christendom, and promoted his political projects. His invasions of Provence and Picardy met with small success. A truce was concluded in 1537, and in 1538 prolonged for ten years. The two monarchs had an interview, in which they spoke only of mutual respect and esteem. Soon after Charles, on leaving Spain, where he had annihilated the old constitution of the Cortes, wished to pass through France to the Netherlands. He spent six days with Francis I. in Paris, where the two princes appeared together in all public places like brothers. Courtiers were not wanting who advised the King of France to detain his guest until he had annulled the Treaty of Madrid; but Francis was satisfied with promises, which Charles very soon forgot. Having quelled the disturbances in the Netherlands, Charles resolved, in 1541, to crown his reputation by the conquest of Algiers. He embarked in the stormy season, and lost a part of his fleet and army without gaining any advantage. After his return his refusal to invest the King of France with the territory of Milan involved him in a new war, in which the King of England embraced his part. The army of Charles was defeated at Cerisola; but, on the other hand, he penetrated to the heart of Champagne. The disturbances caused in Germany by the Reformation induced the emperor to accede to the Peace of Crespy in 1545.

The policy of Charles was to reconcile the two parties, and with this view he alternately threatened and courted the Protestants. After some show of negotiation the Protestant princes raised the standard of war. The emperor declared, in 1546, the heads of the league under the ban of the empire, excited divisions among the confederates, collected an army in haste, and obtained several advantages over his enemies. John Frederick, the elector of Saxony, was taken prisoner in the battle of Mühlberg in 1547. Charles received him sternly, and gave him over to a court-martial consisting of Italians and Spaniards, under the presidency of Alva, which condemned him to death. The elector saved his life only by renouncing his electorate and his hereditary estates, but he remained a prisoner. Meanwhile the emperor appeared somewhat more moderately inclined towards the vanquished party. On coming to Wittenberg he expressed surprise that the exercise of the Lutheran worship had been discontinued. He visited the grave of Luther, and said, 'I do not war with the dead; let him rest in peace; he is already before his Judge.' The Landgrave of Hesse-Cassel, one of the heads of the Protestants, was compelled to sue for mercy. Notwithstanding his promise Charles deprived him of his freedom. After having dissolved the League of Schmalkalden the emperor again occupied himself with the plan of uniting all religious parties, and for this purpose issued the Interim (which see), which was as fruitless as the measures proposed by him at the Diet of Augsburg. Neither was he successful in securing the imperial crown to his son. Discord still agitated public sentiment, and a new war broke out against him. Maurice of Saxony, whom he had invested with the electoral dignity, formed a league, which was joined by Henry II., king of France, the successor of Francis. The preparations had been made with the greatest secrecy. Charles was at Innsbruck superintending the deliberations of the Council of Trent, and meditating great plans against France and Turkey. He was expecting the aid of Maurice when this prince threw off the mask, appeared suddenly at the head of an army, and invaded the Tyrol in 1552 while Henry II. entered Lorraine. Charles was very nearly surprised in Innsbruck in the middle of a stormy night. Tormented by the gout, he escaped alone in a litter by difficult roads. Maurice abandoned the imperial castle to plunder, the Council of Trent was dissolved, and the Protestants dictated the conditions of the Treaty of Passau in 1552. Charles was not more successful in Lorraine. He was unable to recover Metz, defended by the Duke of Guise. In Italy he lost Sienna by a revolt. He withdrew to Brussels, where, hard pressed by his enemies, and suffering much from gout, he became gloomy and dejected, and for several months concealed himself from the sight of every one, so that the report of his death was spread through Europe. His last exertions were directed against France, which constantly repelled his assaults. The Diet of Augsburg in 1555 confirmed the Treaty of Passau, and gave the Protestants equal rights with the Catholics.

Charles saw all his plans frustrated and the number of his enemies increasing. He resolved to transfer his hereditary states to his son Philip. Having convened the estates of the Low Countries at Louvain, in 1555, he explained to them the grounds of his resolution, asserted that he had sacrificed himself for the interests of religion and of his subjects, but that his strength was inadequate to further exertion, and that he should devote to God the remainder of his days. He then turned to Philip, who had thrown himself on his knees, and kissed the hand of his father; reminded him of his duties, and made him swear to labour incessantly for the good of the people. He then gave him his blessing, embraced him, and sunk back exhausted on his chair. At that time Charles conferred on Philip the sovereignty of the Netherlands alone. January 15, 1556, he conferred upon him, in like manner, the Spanish throne, reserving for himself merely a pension of 100,000 ducats. The remaining time that he spent in the Netherlands he employed in reconciling his son with France, and effected the conclusion of a truce. Having made an unsuccessful attempt to induce his brother Ferdinand to transfer the imperial crown to the head of his son, he sent a solemn embassy to Germany to announce to the electors his abdication; after which he embarked at Zealand, and landed on the coast of Biscay. He had selected for his residence the monastery of St. Justus, near Plasencia in Estremadura, and here he exchanged sovereignty, dominion, and pomp for the quiet and solitude of a cloister. His amusements were confined to short rides, to the cultivation of a garden, and to mechanical labours. It is said that he made wooden clocks, and being unable to make two clocks go exactly alike, was reminded of the folly of his efforts to bring a number of men to the same sentiments. He attended religious services twice every day, read books of devotion, and by degrees fell into such dejection that his faculties seemed almost impaired. He renounced the most innocent pleasures, and observed the rules of the monastic life in all their rigour. In order to perform an extraordinary act of piety, he resolved to celebrate his own obsequies. Wrapped in a shroud, and surrounded by his retinue, he laid himself in a coffin, which was placed in the middle of the church. The funeral service was performed, and the monarch mingled his voice with those of the clergy who prayed for him. After the last sprinkling all withdrew, and the doors were closed. He remained some time in the coffin, then rose and returned to his cell, where he spent the night in meditation. This is the usual account, but its accuracy is questioned by Sir Wm. Stirling Maxwell in his Cloister Life of Charles V. Some say it hastened his death, which took place Sept. 21, 1558.

Charles had a noble air and refined manners. He spoke little, and smiled seldom. Firm of purpose; slow to decide; prompt to execute; equally rich in resources and sagacious in the choice of them; gifted with a cool judgment, and always master of himself. Circumstances developed his genius and made him great. Although he did not scruple to break his promises, he imposed, by the semblance of magnanimity and sincerity, even on those who had already experienced his perfidy. An acute judge of men, he knew how to use them for his purposes. In misfortune he appears greater than in prosperity. He protected and encouraged the arts and sciences, and is said to have picked up a brush which had fallen from the hand of Titian with the words, 'Titian is worthy of being served by an emperor.' By his wife Eleonora, daughter of Emanuel, king of Portugal, he had one son, afterwards Philip II., and two daughters. He had also several natural children.—Charles V. is one of the most remarkable characters in history. He exhibited no talents in his youth, and in after life, when his armies in Italy were winning battle after battle, he remained quietly in Spain, apparently not much interested in these victories; but even in his early youth his motto was 'not yet' (*nondum*). It was not till his thirtieth year that he showed himself active and independent; but from this time to his abdication he was throughout a monarch. No minister had a decided influence over him. He was indefatigable in business, weighing the reasons on both sides of every case with great minuteness. Granvella was the only person who possessed his entire confidence. (See GRANVELLA.) Wherever he was he imitated the customs of the country, and won the favour of every people except the Germans. Among them he was not liked, owing to the want of the frankness which they expected in their emperor. Charles was slow in punishing as well as in rewarding; but when he did punish, it was with severity; when he rewarded, it was with munificence. His health early declined. In his fortieth year he felt himself weak. His sufferings from the gout were extreme: he could not even open a letter without pain. After his mother's death he thought sometimes that he heard her voice calling to him to follow her. It is said that when arming for battle he trembled; but in the heat of the engagement was as cool as if it were impossible for an emperor to be killed. We know of no work in which the character of Charles has been delineated with more truth than in Ranke's Fürsten und Völker von Südeuropa im 16 und 17 Jahrh. See also Lanz's Correspondenz des Kaisers Karl V. (Leipzig, 1844-46); Gachard, Correspondance de Charles Quint (Brussels, 1859); Stirling Maxwell's Cloister Life of the Emperor Charles V.; Guntram, Kaiser Karl V. (Vienna, 1865), &c. The work of Robertson is too well known to need recommendation.

CHARLES VI., the second son of the Emperor Leopold I., was born Oct. 1, 1685. His father destined him for the Spanish throne. The last prince of the house of Hapsburg, Charles II., disregarding the house of Austria, whose right to the Spanish throne was undoubted, according to the law of inheritance by descent, had by his will made Philip, duke of Anjou, second grandson of Louis XIV., heir of the Spanish monarchy. Accordingly, on the death of Charles II., Nov. 1, 1700, Philip took possession of the vacant kingdom. England and Holland united against him, and this alliance was soon joined by the German Empire, Portugal, and Savoy. Charles was proclaimed King of Spain at Vienna, in 1703, and proceeded by way of Holland to England, from whence, in January, 1704, he set sail with 12,000 men for Spain, which was almost wholly occupied by the French, and landed in Catalonia. He succeeded in making himself master of Barcelona; but he was soon besieged there by his rival Philip V. The French had already taken Mont Jouy, preparations were making for an assault on the city, and it seemed as if Charles could not escape being captured. Nevertheless, at the head of a garrison of hardly 2000 men, he made the most obstinate resistance, till the long-expected English fleet appeared, which put to flight the twelve French ships that blockaded the harbour and landed a body of troops, which compelled the French speedily to raise the siege. This event was followed by alternate reverses and successes. Twice Charles reached Madrid, and twice was he driven from the city. The first time, in 1706, he caused himself to be proclaimed king in the capital, under the name of Charles III. He had been a second time compelled to flee to the walls of Barcelona, when he was informed of the death of his brother Joseph I. According to the will of Leopold, this event placed the double crown of Charles V. on his head; to his claims on Spain it added the more certain possession of the Austrian dominions. But the allies did not like to see so much power united in the same hands. Charles repaired to Germany by way of Italy, and on his arrival learned that, at Eugene's suggestion, he had also been elected emperor. His coronation took place at Frankfort, in Dec. 1711; and in the following year he received, at Presburg, the crown of Hungary. At the same time he still retained the empty title of King of Spain. He now prosecuted, under the conduct of Eugene, the Spanish war of Succession, which his brother had carried on with so much success in the Netherlands; but Marlborough's disgrace, and the retreat of the English army, having resulted in a defeat at Denain, the allies concluded a peace with France at Utrecht in 1713, in spite of all the efforts of the emperor to prevent it. He was obliged, in the following year, to sign the Treaty of Rastadt. This treaty secured him in the possession of Milan, Mantua, Sardinia, and the Netherlands. Soon after, in June, 1715, the Turks declared war against Venice. The emperor undertook the defence of this republic. His brave armies, led by Eugene, achieved decisive victories at Peterwardein and Belgrade. But as the Spaniards menaced Italy, Charles concluded, in 1718, the Peace of Passarowicz, by which he obtained Belgrade, the north of Servia, and Temeswar. Cardinal Alberoni, who was at the head of the cabinet of Madrid, involved Austria, by his schemes, in a new war. But the quadruple alliance, concluded at London in 1718, terminated the war, and led to Alberoni's dismissal in 1720. To secure his dominions to his daughter, Maria Theresa, in default of male heirs, Charles strove to induce the various powers to guarantee the pragmatic sanction, which settled the succession in her favour. He succeeded by degrees in gaining the concurrence of all the European powers. The emperor availed himself of a short period of peace to establish various institutions for the benefit of commerce. He visited in person the coasts of Istria, where he caused roads and harbours to be constructed, and vessels to be built. His plans respecting the Indian trade in the Netherlands had not the same success, and he was compelled to sacrifice them to the pretensions of the maritime powers. The reign of this prince, by nature a lover of peace, was marked with perpetual agitations. The succession to the Polish throne, after the death of Augustus II., in 1733, disturbed the peace of Europe. Charles, with Russia, supported the son of this prince; but France and Spain declared themselves for Stanislaus Leczinsky. From this arose a bloody war, which terminated, in 1735, in the loss of the Two Sicilies, and a part of the Duchy of Milan. Austria received Tuscany in exchange for Lorraine, and obtained Parma. Hardly had Charles finished this war, when his alliance with Russia involved him anew in a war with the Turks. In 1737 his troops, under Field-marshal Seckendorf. invaded Servia.

without any declaration of war, and occupied Nissa. But the Turks renewed their attacks with a continually augmented force, and obliged the emperor, after three unsuccessful campaigns, to cede to them by the Peace of Belgrade, in 1739, Walachia and the Austrian part of Servia, with Belgrade. Charles died Oct. 20, 1740, at a time when he was employed in the improvement of his distracted finances, and almost in the act of completing the pragmatic sanction, by causing the Grand-duke of Tuscany, his son-in-law, to be chosen King of the Romans.

CHARLES VII. (properly *Charles Albert*), King of the Romans, born at Brussels in the year 1697, was the son of Maximilian Emanuel, elector of Bavaria, then governor of the Spanish Netherlands. His youth was spent at the imperial court, and in the war against the Turks he commanded the army of auxiliaries sent by his father. In 1722 he married the daughter of Joseph I., having previously renounced all rights which this marriage might give him to the succession to the throne of Austria. In 1726 he succeeded his father as Elector of Bavaria. He was one of the princes who protested against the pragmatic sanction, guaranteed in 1732 by the diet of Ratisbon, and in consequence concluded a defensive alliance with Saxony. After the death of Charles VI. (which see), in 1740, he refused to acknowledge Maria Theresa as his heiress, founding his own claims to the succession on a testament of Ferdinand I. He was supported by the King of France with a considerable force. In 1741 he was recognized at Lintz as Archduke of Austria. The obstacles thrown in his way by Cardinal Fleury, who wished not to dismember the Austrian monarchy, as well as the want of artillery and ammunition, prevented him from getting possession of Vienna. On the other hand he took Prague, where he was crowned and proclaimed King of Bohemia. In 1742 he was unanimously elected King of the Romans: he made a solemn entry into Frankfort, and was crowned by his brother, the Elector of Cologne. But fortune soon deserted him. The armies of Maria Theresa reconquered all Upper Austria, and overwhelmed Bavaria. It was necessary to abandon Bohemia. Charles fled to Frankfort, and convoked a diet, when an attack of the King of Prussia on Maria Theresa allowed him to return to Munich in 1744, in which city he died in January, 1745, exhausted by grief and disease. He was succeeded in the electorate by his son Maximilian Joseph, in the imperial dignity by Francis I., husband of Maria Theresa.

CHARLES I., King of England and Scotland, was born in Scotland in the year 1600, and was the third son of James VI. and Anne of Denmark. Soon after the birth of his son James succeeded to the crown of England, and upon the death of Prince Henry, in 1612, Robert, the second son, having died in infancy, Charles became heir-apparent, but was not created Prince of Wales until 1616. His youth appears to have passed respectably, little being recorded of him previously to his romantic journey into Spain in company with Buckingham, in order to pay his court in person to the Spanish infanta. Through the arrogance of Buckingham this match was prevented, and the prince was soon after contracted to Henrietta Maria, daughter of Henry IV. of France. In 1625 he succeeded to the throne, on the death of his father, and received the kingdom embroiled in a Spanish war, and full of suspicion and dislike to the minister Buckingham. The first Parliament which he summoned, being much more disposed to state grievances than grant supplies, was dissolved; and by loans and other expedients an expedition was fitted out against Spain which terminated in disgrace and disappointment. In the next year a new Parliament was summoned, and the disgust and jealousy which prevailed between the king and this assembly laid the foundation of the misfortunes of his reign. The House of Commons impeached the minister, and the king supported him. They held fast the public purse, and he intimated a design of following new counsels should they continue to resist his will, and suddenly and angrily dissolved them, after a short session, while they were preparing a remonstrance against the levying of tonnage and poundage without consent of Parliament. Charles then began to employ his threatened mode of raising funds by loans, benevolences, and similar unpopular proceedings; which, however partially sanctioned by precedent, were wholly opposed to the rising notions of civil liberty throughout the nation, and to the constitutional doctrine which rendered the Commons the guardian and dispenser of the public treasure. His difficulties were further increased by a preposterous war with France, intended to gratify the private enmity of Buckingham, who added to the odium against him by an ill-fated expedition to assist the Huguenots of Rochelle.

In 1628 the king was obliged to call a new Parliament, which showed itself as much opposed to arbitrary measures as its predecessor, and after voting the supplies prepared a bill called 'A Petition of Right, recognizing all the Legal Privileges of the Subject,' which, notwithstanding the employment of all manner of arts and expedients to avoid it, Charles was constrained to pass into a law; and had the concession been unequivocal and sincere, and the constitutional mode of government which it implied been really adopted by both sides, much that followed might have been prevented. Charles, however, by his open encouragement of the doctrines of such divines as Sibthorpe and Mainwaring, who publicly inculcated the doctrine of passive obedience, and represented all limitation of kingly power as seditious and impious, too clearly sanctioned the jealousy of the Commons, who would not, in consequence, rest in confidence or slacken their attacks upon Buckingham, on which account they were suddenly prorogued. The assassination of the favourite soon after by the enthusiast Felton removed one source of discord, and Charles became more his own minister, and some differences with his queen, which had been fomented by Buckingham, being made up, he ever after continued much under her influence. The Parliament which met in January, 1628, manifested so determined a spirit against the king's claim of levying tonnage and poundage by his own authority, that it was suddenly dissolved, and Charles was determined to try to reign without one. For this purpose, having judiciously terminated the pending wars between France and Spain, he raised Sir Thomas Wentworth, afterwards so celebrated as Lord Strafford, to the principal place in his councils. This able statesman had begun his political career in opposition to the court, but having been gained over, was, by his austerity, talent, and firmness, an exceedingly fit instrument to curb the spirit of resistance to prerogative, which had become so strong among the Commons. In ecclesiastical affairs Charles, unhappily for himself and the church, was guided by the counsels of Laud, then bishop of London, a prelate whose learning and piety were debased by superstition and a zeal as indiscreet as intolerant. Under these counsels about eleven years passed away in the execution of plans for raising money without the aid of Parliament, with other dangerous expedients. The arbitrary courts of High-commission and Star-chamber, in the hands of Laud, also exercised in many instances the most grievous oppression, of which the treatment of Williams, bishop of Lincoln, and others, affords memorable examples. In 1634 ship-money began to be levied, which being strictly applied to naval purposes, the nation at large acquiesced in it with less than usual repugnance; and some writers, who courageously attacked the court against the principle, were treated with so much severity that others were deterred from following their example. So desperate did the cause of liberty at this time appear, that great numbers of the Puritans emigrated to New England, and by order of the court a ship was prevented from sailing, in which were Sir Arthur Hazelrig, John Hampden, and Oliver Cromwell. It was in 1637, not long after this remarkable event, that Hampden commenced the career of resistance by refusing to pay ship-money, the right to levy which, without authority of Parliament, he was determined to bring before a court of law. His cause was argued for twelve days in the Court of Exchequer; and although he lost it by the decision of eight of the judges out of twelve, the discussion of the question produced a very powerful impression on the public mind.

It was in Scotland, however, that formal warlike opposition was destined to commence. From the beginning of his reign Charles had endeavoured to introduce into that country a liturgy copied from the English—an innovation which produced the most violent tumults, and ended in the formation of the famous *Covenant* in 1638, by which all classes of people mutually engaged to stand by each other. The Covenanters levied an army, which the king opposed by an ill-disciplined English force, so equivocally inclined, that, not able to trust it, Charles agreed to a sort of pacification. The next year he raised another army, but his finances being exhausted, after an intermission of eleven years he again assembled a Parliament, which, as usual, began to state grievances previously to granting supplies. Losing all patience, the king once more hastily dissolved it, and prosecuted several members who had distinguished themselves by their opposition. Raising money in the best manner he could devise, an English army was again made to proceed towards the north; but, being defeated by the Scots, it became obvious that affairs could no longer be managed without a Parliament, and in 1640 that dreaded assembly was again summoned, which proved to be the famous Long Parliament, whose career forms so memorable a portion of English history. It is not within the limits of this work to give an account of the proceedings connected with the prosecution, condemnation, and execution of Strafford and Laud, or the various measures of reaction in regard to ship-money, tonnage and poundage, and the abolition of the iniquitous courts of High-commission and Star-chamber. Suffice it to say, that Charles soon found himself obliged to be a comparatively passive spectator of the ascendency of the democratical portion of the constitution, and was obliged, both in Scotland and in England, to yield to the torrent which assailed him.

In the meantime a flame burst out in Ireland, which had no small effect in kindling the ensuing conflagration at home. The oppressed Catholic population of that country, during the confusion of the times, rose against the government for the purpose of regaining their rights. Very exaggerated accounts of the massacre of the Protestants are to be found in several of the historians. Later writers have established the fact that the number who perished in this insurrection was not great. The old Catholic settlers of the English pale joined the native Irish, and to strengthen their cause pretended to have a royal commission, and to act in defence of the king's prerogative against a puritanical and republican Parliament. This pretended commission is now generally deemed a forgery; but such was the supposed partiality of Charles to Popery that this event added considerably to popular disaffection. The Parliament being summoned, the king left the conduct of the war entirely to it; but it now became evident that the Commons intended systematically to pursue their advantages, and to reduce the crown to a state of complete dependence. They framed a remonstrance containing a recapitulation of all the errors of the reign; renewed an attempt for excluding bishops from the House of Lords; passed ordinances against superstitious practices; and so inflamed the popular odium against the Episcopal orders as to intimidate its members from attending to their duty in Parliament.

At length, it being apparent that either the zealous adherents of prerogative, or those who were anxious to establish the government upon a more democratic basis, must give way, Charles, instigated, it is supposed, by the injudicious advice of his queen and Lord Digby, caused his attorney-general to enter, in the House of Peers, an accusation against five leading members of the Commons, and sent a sergeant-at-arms to the house to demand them. Receiving an evasive answer, he, the next day, proceeded himself to the house, with an armed retinue, to seize their persons. Aware of this intention, they had previously withdrawn; but the king's appearance with a guard caused the house to break up in great disorder and indignation. The accused members retired into the city, where a committee of the house was appointed to sit, and the city militia was mustered under a commander appointed by Parliament, which also demanded the control of the army. Here the king made his last stand, the matter having now arrived at a point which arms alone could decide. The queen fled to Holland to procure ammunition, and Charles, with the Prince of Wales, proceeded northwards, and for a time fixed his residence at York. The king was received in his progress with great demonstrations of loyalty from the gentry; and many eminent and virtuous characters, who had been the conscientious opposers of his arbitrary measures in the first instance, now joined his party. On the other hand, all the Puritans, the inhabitants of the great trading towns, and those who had adopted republican notions of government, sided with the Parliament; and in no public contest was more private and public virtue ranged on both sides, however alloyed, as in all such cases, with ambition, bigotry, and the baser passions. The first action of consequence was the battle of Edge Hill (23d Oct. 1642), which, although indecisive, enabled the king to approach London, and produce considerable alarm. He then retired to Oxford, and negotiations were entered into which proved unavailing. Nothing decisive, however, happened against the royal side until the battle of Marston Moor in 1644, which was gained chiefly by the skill and valour of Cromwell. The succeeding year completed the ruin of the king's affairs, by the loss of the battle of Naseby.

Thenceforward a series of disasters attended his armies throughout the kingdom, and he took the resolution of throwing himself into the hands of the Scottish army, then lying before Newark (5th May, 1646). He was received with respect, although placed under guard as a prisoner; and, a series of abortive negotiations ensuing, an agreement was made with the Parliament to surrender him to their commissioners, on the payment of a large sum, claimed as arrears by the Scottish army. The king was accordingly surrendered to the commissioners appointed (30th January, 1647), and was carried, in the first place, to Holmby House, in Northamptonshire; subsequently, to the head-quarters of the army at Reading; and soon after to Hampton Court, where he was treated with no small portion of the respect becoming his station. In the meantime, however, the army and Independents becoming all-powerful, he was led into some fears for his personal safety, and, making his escape with a few attendants, proceeded to the southern coast. Not meeting a vessel, as he expected, he crossed over to the Isle of Wight, and put himself into the hands of Hammond, the governor, a creature of Cromwell's, by whom he was lodged in Carisbrooke Castle.

While the king was in this situation, the Scots, regretting the manner in which they had delivered him up, and indignant at the proceedings of the English, marched a considerable army to his relief, under the Duke of Hamilton. This force, although strengthened by a large body of English royalists, was entirely routed and dispersed by Cromwell at Preston, as were the insurgents in Kent and Essex by Fairfax. During this employment of the army and its leaders a new negotiation was opened with the king in the Isle of Wight, who agreed to nearly everything demanded of him, except the abolition of Episcopacy; and so much had it now become the interest of the Parliament itself to comply with him, that a vote was at length carried, that the king's concessions were a sufficient ground for a treaty. The triumphant army, however, on its return, cleared the house by force of all the members opposed to its views; and thereby procuring a reversal of this vote, the king's person was again seized, and, being brought from the Isle of Wight to Hurst Castle, preparations were made for trying him on the capital charge of high treason against the people. As the House of Lords refused to concur in a vote for this purpose, the Commons declared its concurrence unnecessary; and the king, being conducted to London and stripped of all ensigns of royalty, was brought before the court of justice specially erected for this unprecedented trial, on the 20th of January, 1649.

The behaviour of Charles had been calm and dignified throughout his adversity, and in no respect was it more so than on this occasion. Three times he objected to the authority of the court when brought before it, and supported his refusal by clear and cogent arguments. At length, evidence being heard against him on the proof that he had appeared in arms against the parliamentary forces, sentence of death was pronounced against him. He requested a conference with both houses, which was rejected, and only three days were allowed him to prepare for his fate. The interposition of foreign powers, the devotion of friends and ministers, who sought to save him by taking all the blame upon themselves, were vain. After passing the three days in religious exercises, and in tender interviews with his friends and family, he was led to the scaffold. His execution took place before the Banqueting House, Whitehall, on the 30th of Jan. 1649, where, after addressing the people around him with great firmness and composure, the ill-fated king submitted to the fatal stroke.

Thus died Charles I. in the forty-ninth year of his age. He was, in an eminent degree, temperate, chaste, and religious, and although somewhat cold and reserved in demeanour, was really kind and affectionate. His talents were also considerable; but he was deficient in the decision and self-reliance which are necessary to superior executive ability. His mind was cultivated by letters and a taste for the polite arts, particularly painting, the professors of which he munificently encouraged; and his collections of works of art show great judgment in the selection. He had also some taste for poetry, and wrote in a good prose style, though we cannot adduce the Eikon Basiliké as a specimen, since his claim to its authorship is clearly untenable. To all these personal and private acquirements he joined a graceful figure and pleasing countenance, and, under happier circumstances, would doubtless have been regarded as a very accomplished sovereign.

With respect to his political character, as exhibited in the great struggle between himself and the Parliament, it is impossible not to perceive that he strove to maintain a portion of prerogative that had become incompatible with any theory of civil and religious liberty; but it is equally certain that he only sought to retain what his predecessors had possessed. There are periods in the history of every people in which old and new opinions conflict, and a concussion becomes unavoidable; and it was the misfortune of Charles to occupy the throne at a time when the development of the representative system necessarily brought it into conflict with the claims of prerogative. If the Parliament had acquiesced in the kingly pretensions, as usually explained by Laud and the high-churchmen of the day, it would have dwindled into a mere registry of royal edicts, like those of France. On the other hand, Charles acted a part which every monarch in his situation may be expected to act; for a philosophical appreciation of the true nature of a political crisis is scarcely to be expected from one who sits upon a throne. The most forcible accusation against Charles is on the score of insincerity. It is asserted that he never intended to fulfil the conditions imposed upon him. This can scarcely be denied; but it is equally certain that some of them might justly be deemed questionable, and may even have been imposed in order to produce that conduct in the king which so naturally followed. On the whole, though it would be absurd to consider him a *martyr*, as is perhaps still done by a very few, there may be little hesitation in regarding him as a victim to a crisis which the growing power of the Commons, and the unsettled nature of the prerogative, rendered sooner or later inevitable. His fate, like that of the house of Stuart generally, exhibits the danger and absurdity of those high theoretical notions of kingly prerogative, which have too frequently seduced rulers holding them into encounters with national currents of principle and action, a resistance to which is generally destructive. See works by S. R. Gardiner, especially his History of England (1603–1642), and his History of the Great Civil War.

CHARLES II., King of England, Ireland, and Scotland, son of Charles I. and Henrietta Maria of France, was born in London on May 29, 1630. He was a refugee at the Hague on the death of his father, on which he immediately assumed the royal title. He first intended to proceed to Ireland, but was prevented by the progress of Cromwell. He therefore listened to an invitation from the Scots, who had proclaimed him their king on Feb. 5, 1649, and arrived in the Cromarty Firth on 16th June, 1650. Being obliged to throw himself into the hands of the rigid Presbyterians, they subjected him to many severities and mortifications, which caused him to regard that sect ever after with extreme aversion. In 1651 he was crowned at Scone; but the approach of Cromwell with his conquering army soon rendered his abode in Scotland unsafe. Hoping to be joined by the English royalists, he took the spirited resolution of passing Cromwell and entering England, Carlisle readily throwing open its gates to receive him. He was immediately pursued by that active commander, who, with a superior army, gained the battle of Worcester, and Charles, after a variety of imminent hazards, being on one occasion sheltered for twenty-four hours in the branches of the famous Boscobel oak, reached Shoreham, in Sussex, and effected a passage to France. He passed some years in Paris, little regarded by the court, which was awed by the power of the English Commonwealth; and this indignity induced him to retire to Cologne.

It is the province of history to state the circumstances that produced the Restoration, which General Monk so conducted, that Charles, without a struggle, succeeded at once to all those dangerous prerogatives which it had cost the nation so much blood and treasure, first to abridge and then to abolish. This unrestrictive return was not more injurious to the nation than fatal to the family of the Stuarts, which, had a more rational policy prevailed, might have occupied the throne at this moment. On the 29th of May, 1660, Charles entered his capital amidst universal and almost frantic acclamations; and the different civil and religious parties vied with each other in loyalty and submission. His first measures were prudent and conciliatory. Hyde, Lord Clarendon, was made chancellor and prime-minister; and an act of indemnity was passed, from which those alone were excepted who were immediately concerned in the late king's death. A settled revenue was accepted in lieu of wardship and purveyance, and the army was reduced. In respect to religion, there was less indulgence; for not only were prelacy and the parliamentary rights of bishops restored, which was to be expected, but an act of uniformity was passed, by the conditions of which nearly all the Presbyterian clergy were driven to a resignation of their livings. In 1662 he married the Infanta of Portugal, a prudent and virtuous princess, but in no way calculated to acquire the affection of a man like Charles. The indolence of his temper and the expenses of his licentious way of life soon involved him in pecuniary difficulties; and the unpopular sale of Dunkirk to the French was one of his most early expedients to relieve himself. In 1663 a rupture took place with Holland, which, as it proceeded from commercial rivalry, was willingly supported by Parliament. It was attended, in the first instance, by various naval successes; but France and Denmark entering into the war, as allies of the Dutch, the English were overmatched, and a Dutch fleet entered the Thames, and, proceeding up the Medway, burned and destroyed ships as high as Chatham. Such was the naval disgrace of a reign which, on many other accounts, is probably the most discreditable and disastrous in the English annals. The domestic calamities of a dreadful plague in 1665, and of the great fire of London in 1666, added to the disasters of the period. Soon after, Clarendon, who had become very unpopular, and was personally disagreeable to Charles, was dismissed, and sought shelter from his enemies by a voluntary exile. A triple alliance between England, Holland, and Sweden, for the purpose of checking the ambition of Louis XIV., followed. It did honour to the political talents of Sir William Temple, and was one of the few public measures of the reign which deserve approbation. The thoughtless profusion of Charles, however, soon brought him into a condition which rendered him the mere pensioner of Louis, by whose secret aid he was supported in all his attempts to abridge the freedom of his people. In 1670 he threw himself into the hands of the five unprincipled ministers, collectively denominated the *cabal*, who supported him in every attempt to make himself independent of Parliament. A visit which Charles received from his sister, the Duchess of Orleans, was rendered subservient to French policy, by means of one of her attendant ladies, a beautiful French woman. This female made, as was intended, a conquest of Charles, who created her Duchess of Portsmouth; and, amidst all his other attachments, she retained an influence over him which kept him steadily attached to France.

The party troubles of this reign commenced about this time by the open declaration of the Duke of York, presumptive heir to the crown, that he was a convert to the Roman Catholic religion. Soon after, the ministry broke the triple alliance, and planned a rupture with the Dutch; and as the king did not choose to apply to Parliament for money to carry on the projected war, he caused the exchequer to be shut up in January, 1672, and, by several other disgraceful and arbitrary proceedings, gave great disgust and alarm to the nation. The naval operations against the Dutch were by no means successful, and a new Parliament being called, which strongly expressed the discontent of the nation, the cabal was dissolved, and a separate peace made with Holland in 1674. Divisions in the cabinet, fluctuations in the king's measures, and parliamentary contests, followed, and occupied the next three years, until, in 1677, Charles performed a popular act, by marrying his niece, the princess Mary, to the Prince of Orange. By taking some decided steps in favour of the Dutch he also forwarded the Peace of Nimeguen in 1678. The same year was distinguished by the pretended discovery of the Popish plot for the assassination of the king, and the introduction of the Catholic religion. Notwithstanding the infamous characters of Oates and Bedloe, and the improbable nature of their disclosures, their tale, supported by the general suspicion of the secret influence of a Catholic faction, met with universal belief; the Parliament exhibiting nearly as much credulity and heat as the vulgar. Many Catholic lords were committed; Coleman, the Duke of York's secretary, and several priests, were hanged; and a venerable nobleman, the Earl of Stafford, was beheaded. The Duke of York thought fit to retire to Brussels, and a bill for his exclusion from the throne passed the House of Commons. Such was the state of the country that Charles was obliged to give way to some popular measures, and the great palladium of civil liberty, the Habeas Corpus Bill, passed during this session. The temper of the Parliament was so much excited that the king first prorogued and then dissolved it. The court now sought to establish a balance of parties; to distinguish which, the terms *Whig* and *Tory* were about this time brought into use.

In 1680 a new Parliament assembled, and the Commons again passed the Exclusion Bill, which was rejected by the Lords. This Parliament was also dissolved in the next year, and a new one called at Oxford, which proved so restive, that a sudden dissolution of it ensued; and, like his father, Charles determined henceforward to govern without one. By the aid of the Tory gentry and the clergy he obtained loyal addresses from all parts of the kingdom, and attachment to high monarchical principles came again into vogue. The charge of plots and conspiracies was now brought against the Presbyterians. A person named College was executed upon the same infamous evidence as had been previously turned against the Catholics; and the Earl of Shaftesbury, who headed the popular party, was brought to trial, but acquitted. The Nonconformists, generally, were also treated with much rigour; and a step of great moment, in the progress to arbitrary power, was the instituting suits at law (*quo warrantos*) against most of the corporations in the kingdom, by which they were intimidated to a resignation of their charters, in order to receive them back so modelled as to render them much more dependent than before. These rapid strides towards the destruction of liberty at length produced the celebrated Rye House plot, the parties to which certainly intended resistance; but that the assassination of the king was ever formally projected seems very doubtful. It certainly formed no part of the intention of Lord William Russel, whose execution, with that of Algernon Sidney, on account of the plot, forms one of the striking events of this disgraceful reign.

Charles was, at this time, as absolute as any sovereign in Europe; and had he been an active prince, the fetters of tyranny might have been completely rivetted. Scotland, which at different periods of his reign had been driven into insurrection by the arbitrary attempts to restore Episcopacy, was very nearly dragooned into submission; and the relics of the Covenanters were suppressed with circumstances of great barbarity. It is said, however, that Charles was becoming uneasy at this plan, which was chiefly supported by the bigoted austerity of the Duke of York; and that he had made a resolution to relax, when he expired, from the consequences of an apoplectic fit, in February, 1685, in the fifty-fifth year of his age, and twenty-fifth of his reign. At his death he received the sacrament according to the rites of the Romish Church, and thus proved himself to have been, during the whole of his life, as hypocritical as profligate.

The character of Charles II. requires little analysis. He was a confirmed sensualist and voluptuary; and, owing to the example of him and his court, his reign was the era of the most dissolute manners that ever prevailed in England. The stage was an open school of licentiousness, and polite literature was altogether infected by it. Charles was a man of wit, and a good judge of certain kinds of writing, but was too deficient in sensibility to feel either the sublime or the beautiful, in composition; neither was he generous even to the writers whom he applauded. He possessed an easy good nature, but united with it a total indifference to anything but his own pleasure; and no man could be more destitute of honour or generosity. His ideas of the relation between king and subject were evinced by his observation on Lauderdale's cruelties in Scotland:—'I perceive,' said he, 'that Lauderdale has been guilty of many bad things against the people of Scotland; but I cannot find that he has acted in anything contrary to *my* interest.' Yet, with all his selfishness and demerits as a king, Charles always preserved a share of popularity with the multitude, from the easiness of his manners. Pepys' Memoirs and other private documents, however, clearly show the opinion of the more reflecting portion of his subjects; and it is now pretty generally admitted, that, as he was himself a most dishonourable and heartless monarch and man, so his reign exhibited the English character in a more disgraceful light than any other in British history. It need not be added, that he left many illegitimate children, the descendants of some of whom are still among the leading nobility of the country. The fate of his most distinguished son, the ill-fated Duke of Monmouth, is an affair of history.

CHARLES XII., King of Sweden, born at Stockholm, June 27, 1682, was well instructed in the languages, history, geography, and mathematics. He understood German, Latin, and French. Curtius' History of Alexander was his favourite book. On the death of his father, in 1697, when he was but fifteen years old, he was declared of age by the estates. Meanwhile the young king showed but little inclination for business: he loved violent bodily exercises, and especially the chase of the bear. To his jealous neighbours this seemed a favourable time to humble the pride of Sweden. Frederick IV. of Denmark, Augustus II. of Poland, and the Czar Peter I. of Russia concluded an alliance which resulted in the northern war. The Danish troops first invaded the territory of the Duke of Holstein-Gottorp. This prince, who had married the eldest sister of the King of Sweden, repaired to Stockholm and asked for assistance. Charles had a particular attachment for him, and proposed in the council of state the most energetic measures against Denmark. After making some arrangements respecting the internal administration he embarked at Carlscrona in May, 1700. Thirty ships of the line and a great number of small transports, strengthened by an English and Dutch squadron, appeared before Copenhagen. Arrangements were making for the disembarkation when Charles, full of impatience, plunged from his boat into the water, and was the first who reached land. The Danes retired before the superior power of the enemy. Copenhagen was on the point of being besieged when the peace negotiated at Travendal was signed (Aug. 8, 1700), by which the Duke of Holstein was confirmed in all the rights of which it had been attempted to deprive him. Thus ended the first enterprise of Charles XII., in which he exhibited as much intelligence and courage as disinterestedness. He adopted at this time that severe and temperate mode of life to which he ever remained true, avoiding relaxation and useless amusements; wine was banished from his table; at times coarse bread was his only food; he often slept in his cloak on the ground; he generally wore a blue coat, with copper buttons, large boots reaching above his knees, and gloves of buffalo skin.

After thus checking Denmark the attacks of Augustus and Peter were to be repelled. The former was besieging Riga, the latter menaced Narva and the country situated about the Gulf of Finland. Without returning to his capital, which in fact he never revisited, Charles caused 20,000 men to be transported to Livonia, and went to meet the Russians, whom he found 80,000 strong in a fortified camp under the walls of Narva. On the 30th Nov. 1700 between 8000 and 10,000 Swedes placed themselves in order of battle, under the fire of the Russians, and the engagement began. On the previous evening Peter had left his camp on pretence of bringing up reinforcements. In less than a quarter of an hour the Russian camp was taken by storm. Thirty thousand Russians perished on the field or threw themselves into the Narva; the rest were taken prisoners or dispersed. After this victory Charles crossed the Dwina, attacked the intrenchments of the Saxons, and gained a decisive victory. Charles might now have concluded a peace which would have made him the arbiter of the North; but instead of so doing he pursued Augustus to Poland, and determined to take advantage of the discontent of a great part of the nation for the purpose of dethroning him. Augustus attempted in vain to enter into negotiations; in vain did the Countess Königsmark, mistress of Augustus, endeavour to obtain an interview with Charles, and disarm by her beauty the Swedish hero, who all his life long remained indifferent to, and uninfluenced by the sex. Charles refused to negotiate with the king or to speak with the countess.

The war continued: the Swedes gained a brilliant victory at Clissau; in 1703 all Poland was in the possession of the conquerors; the cardinal primate declared the throne vacant; and by the influence of Charles the new choice fell on Stanislaus Leczinsky. Augustus hoped to be secure in Saxony, as Peter had meanwhile occupied Ingria, and founded St. Petersburg, at the mouth of the Neva. But the victor of Narva despised an enemy on whom he hoped, sooner or later, to take an easy revenge, and invaded Saxony. At Altranstadt (which see) he dictated the conditions of peace in 1706. The Livonian Patkul, who was the prime mover of the alliance against Sweden (at that time Peter's ambassador in Dresden), was delivered up to him on his demand, and was broken on the wheel. It might well cause general astonishment that a prince, till then so magnanimous, could stoop to such intemperate revenge. In other respects Charles exhibited, during his stay in Saxony, moderation and magnanimity. He subjected his troops to the strictest discipline. Several ambassadors and princes visited the camp of the king at Altranstadt, among whom was Marlborough, who sought to discover Charles' plans, urged him to direct all his energies against Russia, and convinced himself that the victorious hero would take no part in the great contests of the South. The King of Sweden, however, before he left Germany, required the emperor to grant to the Lutherans in Silesia perfect freedom of conscience; and the requisition was complied with.

In Sept. 1707, the Swedes left Saxony. They were 43,000 strong, well clothed, well disciplined, and enriched by the contributions imposed on the conquered. Six thousand men remained for the protection of the King of Poland: with the rest of the army Charles took the shortest route to Moscow. But having reached the region of Smolensk he altered his plan, at the suggestion of the Cossack hetman Mazeppa, and proceeded to the Ukraine, in the hope that the Cossacks would join him. But Peter laid waste their country, and the proscribed Mazeppa could not procure the promised aid. The difficult marches, the want of provisions, the perpetual attacks of the enemy, and the severe cold, weakened Charles' army in an uncommon degree. General Lewenhaupt, who was to bring reinforcements and provisions from Livonia, arrived with only a few troops, exhausted by the march and by continual skirmishes with the Russians. Pultawa, abundantly furnished with stores, was about to be invested when Peter appeared with 70,000 men. Charles, in reconnoitring, was dangerously wounded in the thigh; consequently, in the battle of July 8, 1709, which changed the fortunes of the Swedish hero and the fate of the North, he was obliged to issue his commands from a litter, without being able to encourage his soldiers by his presence. This, and still more the want of agreement between Rehnsköld and Lewenhaupt, were the reasons why the Swedes did not display their usual skill in manœuvring, which had so often given them the victory. They were obliged to yield to superior force, and the enemy obtained a complete victory. Charles saw his generals, his favourite minister, Count Piper, and the flower of his army, fall into the power of those Russians so easily vanquished at Narva. He himself, together with Mazeppa, fled with a small guard, and was obliged, notwithstanding the pain of his wounds, to go several miles on foot. He finally found refuge and an honourable reception at Bender, in the Turkish territory. His enemies were now inspired with new hope. Augustus protested against the treaty of Altranstadt; Peter invaded Livonia; Frederick of Denmark made a descent on Schonen.

The regency in Stockholm took measures for the defence of the Swedish territory. General Steinbock assembled a body of militia and peasants, defeated the Danes at Helsingborg, and compelled them to evacuate Schonen. Several divisions were sent to Finland to keep off the Russians, who nevertheless advanced, being superior in numbers. Charles, meanwhile, negotiated at Bender with the Porte; succeeded in removing the ministers who were opposed to him, and induced the Turks to declare war against Russia. The armies met on the banks of the river Pruth, July 1, 1711. Peter seemed nearly ruined when the courage and prudence of his wife (see CATHARINE) produced a peace, in which the interests of Charles were entirely neglected. This monarch, however, projected at Bender new plans, and through his agents solicited of the Porte auxiliaries against his enemies. But the Russian agents were no less active to prepossess the Porte against him, pretending that Charles designed to make himself, in the person of Stanislaus, the actual master of Poland, in order from thence, in connection with the German Emperor, to attack the Turks. The seraskier of Bender was ordered to compel the king to depart, and in case he refused, to bring him, living or dead, to Adrianople. Little used to obey the will of another, and apprehensive of being given up to his enemies, Charles resolved to defy the forces of the Porte with the 200 or 300 men of which his retinue consisted, and, sword in hand, to await his fate. When his residence at Varnitza, near Bender, was attacked by the Turks he defended it against a whole army, and yielded only step by step. The house took fire, and he was about to abandon it when, his spurs becoming entangled, he fell and was taken prisoner. His eyelashes were singed by powder, and his clothes covered with blood. Some days after this singular contest Stanislaus came to Bender to ask the King of Sweden to give his consent to the treaty which he saw himself obliged to conclude with Augustus; but Charles refused. The Turks now removed their prisoner from Bender to Demotica, near Adrianople. Here he spent two months in bed, feigning sickness, and employed in reading and writing. Convinced at last that he could expect no assistance from the Porte he sent a parting embassy to Constantinople, and set off in disguise with two officers.

Accustomed to every deprivation Charles pursued his journey on horseback through Hungary and Germany, day and night, with such haste that only one of his attendants was able to keep up with him. Exhausted and haggard, he arrived before Stralsund about one o'clock on the night of the 22d Nov. 1714. Pretending to be a courier with important despatches from Turkey he caused himself to be immediately introduced to the commandant, Count Dunker, who questioned him concerning the king, without recognizing him till he began to speak, when he sprang joyfully from his bed and embraced the knees of his master. The report of Charles' arrival spread rapidly throughout the city. The houses were illuminated. A combined army of Danes, Saxons, Russians, and Prussians immediately invested Stralsund. Charles performed, during the defence, miracles of bravery. But being obliged to surrender the fortress, on Dec. 23, 1715, he proceeded to Lund, in Schonen, and took measures to secure the coast. He then attacked Norway. The Baron of Görtz, whose bold but intelligent plans were adapted to the situation of the Swedish monarchy, was at that time his confidential friend. His advice was, that Charles should gain Peter the Great to the interest of Sweden by important concessions, make himself master of Norway, and from thence land in Scotland, in order to dethrone George I., who had declared himself against Charles. Görtz discovered resources for prosecuting the war, and entered into negotiations at Aland with the plenipotentiaries of the czar. Peter was already gained and a part of Norway conquered; the fortunes of Sweden seemed to assume a favourable aspect; Charles was besieging Frederikshall, when, on Nov. 30, 1718, as he was in the trenches, leaning against the parapet and examining the workmen, he was struck on the head by a cannon-ball. He was found dead in the same position, his hand on his sword, in his pocket the portrait of Gustavus Adolphus and a prayer-book. It is more than probable that the ball which killed him was fired, not from the fortress, but from the Swedish side. His adjutant, Siguier, has been accused as an accomplice in his murder. A century afterwards, Nov. 30, 1818, Charles XIV. caused a monument to be erected on the spot where he fell.

At Charles' death Sweden sank from the rank of a leading power. In his last years he had formed great plans for the improvement of its navy, trade, and commerce. At Lund he often conversed with the professors of the university, and attended public disputations on geometry, mechanics, and history. In Bender, the reading of useful books was one of his principal employments: he sent for Swedish scholars, and caused them to travel through Greece and Asia. Accounts of some of these travels have been printed; there are others in manuscript at Upsal. Firmness, valour, and love of justice were the grand features of Charles' character, but were disfigured by an obstinate rashness. After his return he showed himself more peaceable, gentle, moderate, and disposed to politic measures. Posterity, considering him in relation to his times, will say that he had great virtues and great faults; that he was seduced by prosperity, but not overcome by adversity. His history has been written by his chaplain, Norberg. Alderfeld has published his military memoirs. Voltaire's Histoire de Charles XII., though not complete, nor free from errors in dates, names, and geographical facts, is written with much clearness and elegance.

CHARLES XIII., King of Sweden; born Oct. 7, 1748; second son of King Adolphus Frederick, and Louisa Ulrica, sister of Frederick the Great of Prussia. Having been appointed at his birth high-admiral of Sweden, his education was directed chiefly to the learning of naval tactics, for which purpose he engaged in several cruises in the Cattegat. In 1765 he became honorary president of the Society of Sciences at Upsal. In 1770 he commenced the tour of Europe. The death of Adolphus Frederick recalled him to Sweden, where he took an important part in the revolution of 1772. His brother Gustavus III. appointed him governor-general of Stockholm, and Duke of Sudermannland. In 1774 he married Hedwig Elizabeth Charlotte, princess of Holstein-Gottorp. In the war with Russia, in 1788, he received the command of the fleet, defeated the Russians in the Gulf of Finland, and, in the most dangerous season of the year, brought back his fleet in safety to the harbour of Carlscrona, after which he was appointed governor-general of Finland. After the murder of Gustavus III., in 1792, he was placed at the head of the regency, and, happily for Sweden, preserved the country at peace with all other nations, while he united with Denmark for the protection of the navigation in the northern seas. He likewise founded a museum, established a military academy for 200 pupils, and gained universal esteem. In 1796 he resigned the government to Gustavus Adolphus IV., who had become of age, and retired, as a private man, to his castle of Rosersberg. He never appeared again in public life till a revolution hurled Gustavus Adolphus IV., in 1809, from the throne, and placed Charles at the head of the state, as administrator of the realm, and some months afterwards, June 20, 1809, as King of Sweden, at a very critical period. The peace with Russia, at Frederikshamn, Sept. 17, 1809, gave the country the tranquillity necessary for repairing its heavy losses, and for completing the constitution. He had already adopted Prince Christian of Holstein-Sonderburg-Augustenburg as his successor, and after his death, Marshal Bernadotte, who was elected by the estates, in August, 1810, to take the place of the prince. On him he bestowed his entire confidence. May 27, 1811, he founded the order of Charles XIII., which is conferred solely on freemasons of high degree. June 21, 1816, he acceded to the holy alliance. His prudent conduct in the war between France and Russia, in 1812, procured Sweden an indemnification for Finland by the acquisition of Norway, Nov. 4, 1814. Although some disappointed nobles may have given utterance to murmurs against his government, Charles XIII. nevertheless enjoyed the love of his people till his death, Feb. 5, 1818.

CHARLES XIV. See Bernadotte.

CHARLES I., King of Spain. See Charles V., Emperor of Germany.

CHARLES IV., King of Spain, born at Naples, 12th Nov. 1748, came to Madrid in 1759, when his father, Charles III., after the death of his brother, Ferdinand VI., ascended the Spanish throne, and succeeded him Dec. 13, 1788. He was married to the Princess of Parma, Louisa Maria. Too imbecile to govern, he was always ruled by his wife and his ministers, among whom the Prince of Peace, Godoy (which see), duke of Alcudia, from the year 1792, had unbounded influence over him. The hatred which this favourite drew on himself from the Prince of Asturias and other grandees brought on a revolution in 1808, which enabled Napoleon to dethrone the Bourbons. (See Spain.) Charles abdicated at Aranjuez, March 19, revoked this abdication, and finally ceded, at Bayonne, his right to the throne to Napoleon, who settled on him for life the palace of Compiègne and a pension of 6,000,000 francs. Charles after this lived at Compiègne with the queen and her paramour the Prince of Peace, but subsequently exchanged this residence for Rome, where the climate was more congenial to him. From 1815 he occupied the palace Barberini in this city. Hunting he always made his principal employment. He died at Naples, Jan. 19, 1819, of a relapse of the gout, while on a visit to his brother, the King of the Two Sicilies. His wife died a short time previous, in Dec. 1818.

CHARLES, Archduke of Austria, third son of the Emperor Leopold II., was born in Florence, 5th Sept. 1771. In his twentieth year he distinguished himself in the battles of Jemappes and Neerwinden, in both of which the French republican armies were beaten, and was appointed governor-general of Belgium in 1793. In the campaign of the following year victory favoured the French under Pichegru, and the Netherlands were lost. Charles retired to Vienna, where he spent some time recruiting his impaired health. Appointed in 1796 field-marshal of the empire and commander-in-chief of the Austrian army on the Rhine, he opened the campaign by the victory of Neumarkt over Jourdan, which were quickly followed by the successes of Teining and Amberg, which compelled Moreau to make his memorable retreat. In the winter of 1797 he captured Kehl, the only position the French occupied in Germany. Meanwhile Bonaparte had finished his conquest of Italy, and was rapidly pushing his way into the heart of Austria. Charles was sent against him, but it was too late. He was compelled to conclude the Treaty of Leoben (1797), which was followed by the Peace of Campo Formio (which see). After the fruitless congress at Rastadt he again put himself at the head of the Rhine army, and again defeated his old opponent Jourdan at Ostrach and Stockach. Misunderstandings that arose between him and the Russian generals Suwarow and Korsakow, and his weak state of health, compelled him to throw up his command and retire to Bohemia. In the protracted struggle in the heart of Germany Napoleon's genius was on every occasion triumphant, once only, at Aspern, did Charles snatch a victory from him (21st, 22d May, 1809), but the bloody battle of Wagram (5th, 6th July) laid Austria at the feet of the French Emperor. The military career of Charles closes here. In 1815 he married Henrietta, princess of Nassau-Weilburg, by whom he had a numerous family, in the bosom of which he spent his remaining years. He died on the 30th April, 1847.

CHARLES ALBERT, King of Sardinia, born on 2d October, 1798, was descended from a collateral branch of the royal family, and the son of Charles Emmanuel, prince of Savoy-Carignan. He was educated in France, and on the breaking out of the insurrection against the Sardinian government in 1821, was nominated regent by Victor Emmanuel till the arrival of his brother Charles Felix, in whose favour he had been obliged to abdicate. In 1831 he succeeded to the throne as the nearest heir on the death of Charles Felix, and in the first years of his reign showed himself favourable to the cause of progress by promoting a number of beneficial reforms. Subsequently, indeed, he became more absolute in his views, but after the French revolution of February, 1848, he granted the nation a constitution, and took the field against Austria on behalf of the revolted peoples of the Lombardo-Venetian kingdom and the duchies of Central Italy. His arms were at first very successful, defeating the Austrians in various encounters, but he was at last repulsed by Marshal Radetzky, and obliged to apply for an armistice. On its expiration he resumed hostilities, but only to endure reverses. The battle of Novara, fought on 23d March, 1849, proved fatal to the aspirations of Charles Albert and Sardinia. That very day he abdicated in favour of his son, Victor Emmanuel II., afterwards king of Italy, and retired to Oporto, in Portugal, where he died on July 28, 1849. His remains were conveyed to Turin, where a statue has been erected to his memory.

CHARLES AUGUSTUS. See Weimar.

CHARLES EDWARD STUART, called the *Pretender*, grandson of James II., king of England, son of James Edward and Clementina, daughter of Prince Sobieski, was born in 1720 at Rome, where his father enjoyed the friendship of the Popes Clement XI. and Innocent XIII. The last scion of the royal house of Stuart, from the very cradle he was inspired with an impulse that induced him, at the early age of twenty-two, to attempt the recovery of the throne of his ancestors. Supported by the court of Rome, he went to Paris in 1742, disguised as a Spanish courier, and succeeding in gaining over to his views Louis XV., 15,000 men were on the point of sailing from Dunkirk for England, when the English Admiral Norris dispersed the whole French fleet before it had gained the open sea. This prevented the French court from undertaking a second expedition; all the requests of Charles were in vain, and he now resolved to trust to his own exertions. With borrowed money, and seven trusty officers, he landed like a knight-errant, July 28, 1745, at Lochnanuadh, Scotland, from a ship of eighteen guns called the *Doutelle*, which contained arms for 1500 men. The attempt succeeded, and he found so many adherents among the discontented Scottish nobles, who went over to his party, together with the Highlanders under them, that he was soon at the head of a little army. With this he marched forward, conquered the British troops which advanced to meet him from Edinburgh, captured Perth, and caused himself to be proclaimed Regent of England, Scotland, and Ireland. He also took Edinburgh, Sept. 17, 1745, where he was once more proclaimed regent, and surrounded with his ministers and generals. Sept. 22, 1745, he defeated at Prestonpans an army of 4000 British under Sir John Cope. He set the prisoners at liberty. His force was now 7000 strong. With this he advanced, and laid siege to Carlisle, Nov. 15, which, after three days, surrendered, and supplied him with a great number of arms. He now caused his father to be proclaimed King, and himself Regent of England; removed his head-quarters to Manchester, and soon found himself within 100 miles of London, where many of his friends awaited his arrival. The rapid successes of the adventurer made the British government tremble; and a part of the British forces in Germany was recalled. Want of support, disunion, and jealousy among the adherents of the house of Stuart, some errors, and the superior force opposed to him, compelled Prince Charles to retire in the beginning of 1746. The victory at Falkirk (Jan. 28, 1746) was his last. As a final attempt he risked the battle of Culloden, against the Duke of Cumberland, April 16, 1746, in which his army was defeated and entirely dispersed. The prince now wandered about for a long time through the wilds of Scotland, often without food, and the price of £30,000 sterling was set upon his head. Once, when fairly surrounded by enemies, he succeeded in escaping by the devotion and courage of Flora M'Donald. He was at last discovered by his most faithful friend O'Neil, a Scottish nobleman: they escaped detection by sailing in a miserable skiff from island to island, and wandering from valley to valley, pursued by a thousand dangers; for constant search was made for Charles in every direction. At Lochnanuadh he was fortunate enough to meet one of the French frigates which had been sent for his rescue. September 20, 1746, five months after the defeat of Culloden, he sailed from Scotland, and arrived in France destitute of everything. By the interest of Madame de Pompadour Charles now received an annual pension of 200,000 livres for life; he had also 12,000 doubloons yearly from Spain. The Peace of Aix-la-Chapelle (1748) deprived him of all prospect of recovering the throne of Britain; and when he heard that his own removal from France was stipulated in the articles of peace, his anger knew no bounds. He was carried under a guard to the frontiers of Italy. He went to Rome, the residence of his father James III.; but his relations to the Roman court were changed after his father's death, Jan. 1, 1766. His often ridiculous requests in regard to the etiquette to be observed towards him, which he made under the name of Count of Albany, rendered his presence troublesome. He went to Florence till Pius VI. recalled him to Rome by withdrawing his pension. That his family might not become extinct, he married in the fifty-second year of his age, April 17, 1772, a princess of Stolberg-Gedern; but his violence led to a separation in 1780 (see Albany). He now became addicted to intoxication. He died Jan. 31, 1788, in the sixty-eighth year of his life. Three years before he sent for his natural daughter from France, legitimated her, and declared her, on his royal authority, his lawful heiress, under the title of Countess of Albany. His body was carried to Frascati, and entombed in a style worthy of a king. A sceptre, crown, sword, and the escutcheons of England and Scotland adorned his coffin; and his only brother then living, the Cardinal of York, performed the funeral service for 'dead King Charles.' The Cardinal of York received a pension from Britain after 1799, and died at Frascati, July 13, 1807. See Life, by A. C. Ewald; and A. Lang's Prince Charles Edward Stuart (1900).

CHARLES EMANUEL I., Duke of Savoy, surnamed the *Great*, born at the castle of Rivoli in 1562. He proved his courage in the battles of Montbrun, Vigo, Asti, Chatillon, Ostage, at the siege of Berne, and on the walls of Suza. He formed (1590) the plan of uniting Provence to his dominions. Philip II. of Spain, his father-in-law, obliged the parliament of Aix to acknowledge him as the protector of this province, in order by this example to induce France to acknowledge the King of Spain as protector of the whole realm. The Duke of Savoy, not less ambitious, likewise aimed at this crown, and after the death of Matthias desired also to be chosen Emperor of Germany. He likewise intended to conquer the Kingdom of Cyprus, and to take possession of Macedonia, the inhabitants of which, oppressed by the Turks, offered him the sovereignty over their country. The citizens of Geneva were obliged to defend their city in 1602 against this ambitious prince, who fell upon them by night in time of peace (see GENEVA). Henry IV., who had reason to complain of the duke, and whose general, the Duke of Lesdiguieres, had beaten Charles Emanuel several times, entered at last into a treaty of peace with him, not disadvantageous to the Duke of Savoy; but he could not remain quiet, and began again a war with France, Spain, and Germany. He died of apoplexy at Savillon, 1630. He is one of those princes whose title to the surname of Great is questionable. His heart was as hard as his native rocks. He built palaces and churches, loved and patronized the sciences, but thought little of making them sources of happiness.

CHARLES MARTEL, a son of Pepin Héristal (mayor of the palace under the last kings of the Merovingian dynasty). His father had governed under the weak kings of France with so much justice, and so much to the satisfaction of the people, that he was enabled to make his office hereditary in his family. Chilperic II., king of the Franks, refusing to acknowledge Charles Martel as mayor of the palace, the latter deposed him, and set Clothaire IV. in his place. After the death of Clothaire he restored Chilperic, and subsequently placed Thierri on the throne, showing how absolute was the control of the mayor, and that the royal dignity was a mere phantom. Charles Martel rendered his reign famous by the great victory which he gained in October, 732, over the Saracens, near Tours, from which he acquired the name of *Martel*, signifying *hammer*. He died 741. His son Pepin the Short governed the Franks till the year 752, nominally under the effeminate King Childeric III.; but in this year Pope Zachary replied to a question put to him by the states of France, that he ought to be king who had the royal power; in consequence of which the Franks declared Pepin king, at Soissons, in 752. He died in 768, highly honoured by his subjects. His sons were Charlemagne and Carloman (see CHARLEMAGNE).

CHARLES THE BOLD, Duke of Burgundy, son of Philip the Good and Isabella of Portugal, born at Dijon, Nov. 10, 1433, at first bore the name of Count of Charolais, under which he distinguished himself in the battles of Rupelmonde in 1452, and of Morbepue in 1453. His dislike of the lords of the house of Croy, the favourites of his father, was insurmountable; and being unable to procure their disgrace, he withdrew from the court and went to Holland. He was again reconciled, however, with his father, whom he inspired with his own hatred of Louis XI., and placed himself at the head of the party then forming against that monarch, for the purpose of preserving the power in the hands of the feudal nobility. Having passed through Flanders and Artois, he crossed the Somme at the head of 20,000 men, and appeared before Paris. Louis met him at Montlhéri, but was defeated, and had to offer terms of peace at Conflans, whereby he gave up to the victor the towns on the Somme and the counties of Boulogne, Guines, and Ponthieu. Charles succeeded his father in 1467, and immediately engaged in a war with the citizens of Liége, whom he conquered and treated with extreme severity. Before this undertaking he had been obliged to restore to the citizens of Ghent the privileges which had been taken from them by Philip the Good. He now revoked his forced concessions, caused the leaders of the insurrection to be executed, and imposed a large fine on the city. In 1468 he married Margaret of York, sister of the King of England, and resolved immediately to renew the civil war in France; but Louis disarmed him by giving him 120,000 crowns of gold. October 3d of the same year the monarch and the duke had a meeting at Peronne in order to adjust their differences. There the duke learned that the inhabitants of Liége, instigated by the king, had rebelled anew, and made themselves masters of Tongres. Charles was enraged. In vain did Louis on oath protest his innocence. The duke finally compelled the king to sign a treaty, the most disgraceful condition of which was that he should march with Charles against the city of Liége, which he had himself excited against the duke. Charles encamped before Liége in company with the king; the city was taken by storm, and abandoned to the fury of the soldiers. Such success rendered the mind of the duke utterly obdurate, and added the last traits of that inflexible sanguinary character which made him the scourge of his neighbourhood, and led to his own destruction. Edward IV. conferred on him in 1470 the order of the Garter. Shortly after he received in Flanders Edward himself, who came to seek an asylum with the duke. Charles gave him money and ships to return to England.

About the end of the same year the war between the King of France and the Duke of Burgundy was renewed, and never did Charles show himself more deserving of the name of the *Bold*, or *Rash*, than in this war. Forced to sue for a truce, he nevertheless soon took up arms anew, accused the king publicly of magic and poisoning, and, at the head of 24,000 men, crossed the Somme. He took the city of Nesle by storm, caused fire to be set to it, and as he saw it burning, said, with barbarous coolness, 'Such are the fruits of the tree of war.' An enemy to tranquillity, insensible to pleasure, loving nothing but destruction and bloodshed, and, notwithstanding his pride, master of the art of procuring allies, Charles, who desired to be equal to Louis XI. in dignity and rank as well as in power, formed the plan of enlarging his dominions on the Rhine, and elevating his states into a kingdom under the name of Belgic Gaul. He visited the Emperor Frederick III. at Trèves to obtain the title of King and Vicar-general of the Empire, which the emperor had promised him on condition that he should marry his daughter to the archduke; but as neither would enter first into obligations, they separated in dissatisfaction, and the negotiation was broken off.

Louis, meanwhile, involved Charles in greater embarrassments, by exciting against him Austria and the Swiss. Charles now determined to dethrone him, and for this purpose made an alliance with the King of England; but being compelled to hasten to the aid of his relative, the Bishop of Cologne, he lost ten months before Neuss, which he besieged in vain, and then hastened to Lorraine, to take revenge on the Duke René, who, at the instigation of France, had declared war against him. Having completed the conquest of Lorraine by the taking of Nancy in 1475, he turned his arms against the Swiss; and notwithstanding the representations of these peaceful mountaineers, who told him that all that he could find among them would not be worth so much as the spurs of his horsemen, he took the city of Granson, and put to the sword 800 men, by whom it was defended. But these cruelties were soon avenged by the signal victory which the Swiss obtained near the same city, March 3, 1476. The loss of this battle plunged

Charles into a gloomy dejection, which disturbed his mind and his health. With a new army he returned to Switzerland, and lost the battle of Murten (Morat), June 22. The Duke of Lorraine, who had fought in the army of the Swiss, led the victors to the walls of Nancy, which surrendered October 6th. At the first information of this siege Charles marched to Lorraine, to retake the city of Nancy from the Duke René. He intrusted to the Count of Campo-Basso the charge of the first attack, and though assured of the treachery of this officer, refused to believe it. Campo-Basso protracted the siege, and gave René time to come up with 20,000 men. On the approach of this army he deserted, with his troops, to the enemy, so that the army of Charles now consisted of only 4000 men. Against the advice of his council Charles persisted in risking battle with unequal forces. On the 5th or 6th January, 1477 (John von Müller himself is in doubt respecting the day), the two armies met: the wings of the Burgundian army were broken through and dispersed, and the centre, commanded by the duke in person, was attacked in front and flank. As Charles was putting on his helmet, the gilded lion which formed its crest fell to the ground, and he exclaimed with surprise, '*Ecce magnum signum Dei!*' Defeated, and carried along with the current of fugitives, he fell, with his horse, into a ditch, where he was killed by the thrust of a lance, in the forty-fourth year of his age. His body, covered with blood and mire, and with the head imbedded in the ice, was not found till two days after the battle, when it was so disfigured that for some time his own brothers did not recognize it. He was finally known by the length of his beard and nails (which he had suffered to grow since his defeat at Morat), as well as by the scar of a sword-cut, which he had received in the battle of Montlhéri. With this prince expired the feudal government in Burgundy.

Charles was not without good qualities. In the government of his people we find no traces of the severity with which he treated himself, and his natural temper inclined him to a strict administration of justice. He was buried at Nancy, at the command of the Duke of Lorraine. In 1550 Charles V., his great-grandson, caused his remains to be conveyed to Bruges. He was married three times, but left only one daughter, Maria, heiress of Burgundy, by Isabella of Bourbon, his second wife. Compare Kirk's History of Charles the Bold (London, 1863-8, three vols.) In Quentin Durward, Sir Walter Scott has portrayed the character of Charles, and some of the quarrels between him and Louis of France.

CHARLES THE GREAT. See Charlemagne.

CHARLES RIVER, a river in Massachusetts, which flows into Boston harbour, dividing Boston from Charlestown. The source of the principal branch is a pond bordering on Hopkinton. It is navigable for lighters and large boats to Watertown, 7 miles w. of Boston.

CHARLES'S WAIN. See Ursa Major.

CHARLESTON, a city and seaport of South Carolina, in a county of the same name, 101 miles s.s.e. Columbia, 118 n.e. Savannah; pop. in 1900, 55,807. It is situated on a tongue of land formed by the confluence of the rivers Cooper and Ashley, which unite just below the city, and form a spacious and convenient harbour, communicating with the ocean below Sullivan's Island, 7 miles from Charleston. The harbour is defended by several forts. Fort Sumter was said to be one of the best built forts in the United States before the civil war. The city is regularly laid out in parallel streets, which are intersected by others nearly at right angles. Most of the principal thoroughfares are 60 to 70 feet wide and bordered with fine shade-trees. The tongue of land on which it is built was originally indented with creeks and narrow marshes, but these have been filled up; and it is drier and more elevated than most parts of the low country of South Carolina. Many of the houses are elegant and furnished with piazzas. It is much the largest town in the state, and was formerly the seat of government. Among buildings may be mentioned the arsenal, citadel, city-hall, court-house, post-office, Roman Catholic cathedral and other churches. The chief educational institutions are the College of Charleston and South Carolina Medical School. It has an extensive trade both with the interior and with foreign countries, the staple exports being cotton, rosin and turpentine, lumber, rice, wheat, phosphatic fertilizers, and phosphate rock. The development of the shipping trade has hitherto been to some extent hindered by a bar across the entrance to the harbour (which itself is 40 feet deep at the city), but by the construction of two long jetties and by dredging, a much greater depth of water has been secured, and it is hoped that from 25 to 26 feet will ultimately be obtained. The total annual value of the trade, taking exports and imports together, amounts to between £15,000,000 and £16,000,000. The exports are far greater in value than the imports, the chief article of export being cotton. A considerable proportion of the shipping trade of this port is carried on by British vessels. The shipment of phosphatic rock has risen to importance in recent times, as has also the manufacture of phosphatic fertilizers from this rock, now an important industry in the town and neighbourhood. This manufacture necessitates a considerable import of chemicals, such as sulphur, kainit, &c. Other manufactures are cottons, bags, barrels, cotton-seed oil. Garden produce is largely cultivated and exported to northern cities. The city is accounted healthy, more so than that of most other Atlantic towns in the Southern States, though yellow fever at times prevails. It was the scene of the outbreak of the civil war on April 12, 1861, and was visited by severe and destructive earthquakes in 1886.

CHARLESTOWN, since 1874 a part of the municipality of Boston, Massachusetts, previously a separate city and seaport. The principal public buildings are the state prison, the hospital for the insane, a market-house, &c. One of the chief navy-yards in the United States, occupying an area of about a hundred acres, is in the s.e. part of Charlestown. It is inclosed, on the land side, by a wall of solid masonry.

Bunker Hill, on which was fought one of the most celebrated battles of the American Revolution, is in this part of Boston. The British army in Boston had been increased to about 10,000 men by the arrival of reinforcements towards the end of May, 1775, and was under the command of General Gage, governor of Massachusetts Bay, Generals Howe, Clinton, Burgoyne, &c. The American army amounted to about 15,000 men, enlisted for a few months, without organization or discipline. They were armed with fowling-pieces, but few of them provided with bayonets. The whole was under the command of General Ward of Massachusetts, whose head-quarters were at Cambridge. The Americans having received information of the intention of the British to occupy Bunker Hill and the neighbouring heights and advance into the country, determined to take possession of Bunker Hill in the evening, and erect fortifications to defend it. Finding, on their arrival, that, though Bunker Hill was the most commanding position, it was too far from the enemy to annoy his shipping and army, the provincials determined to fortify Breed's Hill, and began their labour soon after midnight. Everything had been conducted with so much silence that the British were not aware of their presence till daybreak, when the ships of war and floating batteries which lay in the harbour of Charlestown, together with a battery on Copp's Hill, opened a heavy fire on the redoubt which had been completed during the night. The Americans meanwhile continued their labour, until they had thrown up a small breastwork extending north from the east side of the redoubt to the bottom of the hill. The British having landed at Morton's Point, in Charlestown, advanced, under Generals Howe and Pigot, against the provincials, who impatiently withheld their fire until, according to the words of Putnam, 'they saw the white of their enemies' eyes'. The British were repulsed with great loss. Had they charged they would probably have been more successful, as the American troops were almost entirely destitute of bayonets. A second attack, during which the village of Charlestown was burned to the ground, was attended with the same result. But the Americans had nearly expended their ammunition, and their communication with the main army was interrupted by the fire of the floating-batteries, which enfiladed Charlestown Neck. The English now rallied for a third attack, determined to concentrate their forces on the redoubt and breastwork, and to charge; at the same time their artillery turned the left of the breastwork, enfiladed the line, and sent their balls directly into the redoubt. The Americans, after resisting with stones and the butts of their guns, retreated under a heavy fire. They were, however, not pursued very warmly, and drew off with an inconsiderable loss. They had 115 killed, among whom was General Warren, 305 wounded, and 30 made prisoners. The British loss was 1054 killed and wounded.

CHARLEVILLE, a town of France, in the department of Ardennes, on the left bank of the Meuse, opposite Mézières, with which it communicates by a suspension bridge. It is regularly built, has straight, wide, and clean streets, and a public square and fountain, surrounded by arcades, from which the four principal streets diverge. It carries on various industries; and the Meuse affords facilities for a large traffic. Charleville was built in 1606 by Charles, duke of Nevers and Mantua, and named after himself. Pop. (1896), 17,805.

CHARLEVILLE, a town of Ireland, in the county of, and 36 miles N.N.W. from Cork, on the Glynn, and on the railway to Dublin. The principal buildings are the Roman Catholic church, the school, the bridewell, and the courthouse. The town, anciently called Rathgoggan, received its present name in compliment to Charles II. It returned two members to the Irish Parliament previous to the Union. Pop. (1891), 1970.

CHARLEVOIX, PIERRE FRANÇOIS XAVIER DE, a French Jesuit, was born at St. Quentin on Oct. 29, 1682, and taught languages and philosophy with some reputation. He was for some years a missionary in America, and on his return he had a chief share in the Journal de Trévoux for twenty-two years. He died in 1761, greatly esteemed for his high moral character and extensive learning. Of his works, the Histoire et Description Générale de la Nouvelle France (1744) is the most valuable. This describes his own experiences, and the manners and customs of the native Americans, for which he is often quoted as a writer of good authority. His other works include histories of Japan, San Domingo, and Paraguay, and a Vie de la Mère Marie de l'Incarnation (1724).

CHARLOTTE, PRINCESS, daughter of Queen Caroline and George IV., was born at Carlton House, Jan. 7, 1796. She was placed under the care of Lady Clifford, and the Bishop of Exeter superintended her studies. She is said to have been well acquainted with the principal ancient writers, and with the history and statistics of the European states, especially with the constitution and laws of her native country. She spoke with ease French, German, Italian, and Spanish, sang well, played on the harp, piano, and guitar, and sketched landscapes from nature with much taste. Her style of writing was pleasing, and she was fond of poetry. In the unfortunate dissensions between her father and mother she inclined to the side of the latter. The Prince of Orange was fixed upon as her future husband, and the nation desired their union, because the prince had been educated in England, and was acquainted with the customs and interests of the people. The union, however, was prevented by the reluctance of the princess to leave England. In 1814 Prince Leopold of Saxe-Coburg (afterwards king of Belgium) visited England in the suite of the allied sovereigns, who went to London after the Peace of Paris. His cultivated mind and amiable manners having made an impression on the heart of the princess, he was permitted to sue for her hand. Their marriage was solemnized May 2, 1816. The prince loved her with tenderness, and their married life at Claremont was very happy. On November 5, 1817, the princess, after three days of suffering, was delivered of a dead child. A few hours after she was seized with convulsions, and breathed her last, to the universal regret of the British Empire.

CHARLOTTE-AMALIE, capital of the Danish island of St. Thomas, in the West Indies. It has an excellent harbour, land-locked from all winds, contains several churches, and is an entrepôt for goods for the neighbouring islands. Pop. 8000.

CHARLOTTENBURG, a town of Prussia, adjoining Berlin on the west, and now practically forming part of it, on the banks of the river Spree. It contains a palace built for Sophia Charlotte, the first queen of Prussia, and begun in the end of the seventeenth century—hence the name of the place. The town was founded soon after, but long made little progress, being quite small till the middle of the nineteenth century. Since then it has made extraordinary progress, having shared in the prosperity and extension which the capital has experienced. The town contains various important educational and other institutions, including a school of artillery and engineering, and a technical high-school. Among the churches is the Kaiser Wilhelm Memorial Church, consecrated in 1895. A beautiful walk starting from the Brandenburg Gate, at the head of the famous Berlin street, *Unter den Linden*, and passing through the park known as the *Thiergarten*, ends here. Charlottenburg is a favourite resort and residence of the Berlinese. In the garden adjoining the castle is the tomb of Frederick William III. and his consort Queen Louisa, by Rauch. Here also their son, the Emperor William I., was buried in 1888. Pop. (1895), 132,377; (1900), 189,290.

CHARLOTTETOWN, a town of Canada, the capital, and near the centre of Prince Edward Island, on the bay of Hillsborough, 110 miles N. of Halifax. It is advantageously situated for commerce, and its harbour is one of the best in North America. It is regularly laid out with spacious squares, and broad streets at right angles; and contains, besides the government buildings, a courthouse, several churches, a fort and barracks, &c. Its industries embrace iron, wool, ship-building, &c., and fishing is carried on. Pop. (1891), 11,374.

CHARON, in mythology, the son of Erebus and Night. It was his office to ferry the dead in his crazy boat over the dark waters of Acheron, over

Cocytus resounding with the doleful lamentations of the dead, and finally over the Styx, dreaded even by the immortals. The shades were each obliged to pay him an obolus, which was put, at the time of burial, into the mouth of the deceased. Those who could not pay the fare, or had been so unfortunate as to find no grave in the upper world, were compelled to wander on the desolate banks of the Acheron till Charon was pleased to carry them over to their final resting-place. He was represented as an old man, with a gloomy aspect, matted beard, and tattered garments. The traditions relative to Charon are posterior to the Homeric age, and it is thought by some of the learned that the myth was imported into Greece from Egypt.

CHAROST, Armand Joseph de Bethune, Duke of, born at Versailles in 1728, a worthy descendant of his great ancestor Sully, distinguished himself on many occasions in the military service of his country. He was the friend and father of his soldiers, and rewarded the brave from his own resources. In 1758 he sent all his plate to the mint to supply the necessities of the state. The peace concluded in 1763 restored him to a more quiet sphere of usefulness, yet he did not discontinue his favours towards the soldiers whom he had commanded. He was particularly active in the promotion of agriculture and public institutions. Long before the revolution he abolished the feudal services on his estates, and wrote against feudal institutions. He established charitable institutions in sundry parishes, provided for the support and instruction of orphans, employed physicians and midwives, founded and liberally endowed an hospital. In a year of dearth he imported grain into Calais at his own expense. In the provincial assemblies he spoke against the *corvées* (which see). In the assembly of the notables he declared himself for an equal distribution of the public burdens. The revolution broke out. Before the decree relative to a patriotic contribution appeared he made a voluntary present of 100,000 francs to the state. During the reign of terror he retired to Meillant, where he was arrested, and did not obtain his liberty until after the 9th Thermidor. In the testimonies given in his behalf by the revolutionary committees he was called the father and benefactor of suffering humanity. He returned to Meillant, where he established an agricultural society. No sacrifice was too great for him, and his vast fortune was scarcely sufficient for his enterprises. He died October 27, 1800, of the small-pox, lamented by the people.

CHARR. See Char.

CHARRIÈRE, Madame St. Hyacinthe de, an authoress who has made herself well known under the assumed name of the Abbé de la Tour, was born in Holland of a wealthy family about 1740, and in early life became a maid of honour at the court of the stadtholder. Her affection for her brother's tutor, M. de Charrière, a worthy but decayed nobleman, led her to forego her rank and family, and shortly after her marriage she retired with him to a small property at Neufchâtel. Her lively temperament was ill suited for the monotony of a rustic life, and accordingly seeking amusement in literary recreations she soon acquired a considerable reputation. Having lost the greater part of her fortune in the French revolution, she reduced her expenditure to the lowest possible amount, that she might be able to continue her various acts of benevolence. Ultimately ingratitude and misfortune preyed upon her spirits, and she spent the last years of her life in almost complete seclusion from the world. She died in 1806. Her works belong chiefly to the class of light literature. Among others may be mentioned Les Trois Femmes, and the favourite dramas of Le Toi et le Vous, L'Emigré, L'Enfant Gâté, and Comment le nomme-t-on. All these productions not only display much wit, truth, and powerful description, but also breathe a spirit of philosophy, and have a strong moral tendency. Most of them have been translated into German by her friend Herder.

CHARRON, Pierre, a celebrated preacher and writer, born at Paris in 1541, was the son of a bookseller, and one of twenty-five children. He studied law at Orleans and Bourges, and had practised for six years as a parliamentary advocate, when he turned his attention to theology, and gained so much fame by his sermons that he was presented in rapid succession with several benefices in Gascogny and Languedoc, and appointed court chaplain to Queen Margaret. In 1588 he returned to Paris with the view of fulfilling a vow he had made to enter the Carthusian order, but owing to his age the prior of the order refused him admission, and the Celestines also declining to receive him, he considered himself relieved from his vow, and continued a secular priest. In 1589 he went to Bordeaux, and became very intimate with Montaigne, whom he tried to imitate, though he failed to catch his ease of style, and original, piquant wit. He died in 1603. His two principal works are Traité des Trois Vérités, and Traité de la Sagesse. The Roman Catholic zeal of the former drew down upon him the rebuke of Duplessis-Mornay; and the extreme liberalism of the latter exposed him to a charge of atheism, for which there appears to have been some foundation, as the treatise was condemned both by parliament and the university.

CHART. See Map.

CHARTER, a written instrument, deed, or document serving as the evidence of some grant, contract, or other important transaction between man and man. Such documents may be either of a public or a private nature. Among the former the term charter is perhaps most commonly applied to a document by which a sovereign, or the sovereign authority in a state, makes a grant of some right or privilege to the members of the body politic, or to one or more of them. In England the term charter was early applied to documents proceeding from the sovereign and granting lands or privileges to subjects, to towns, corporations, &c. The most famous English charter is the Great Charter (*Magna Charta Libcratum*) granted by King John in 1215, on the compulsion of the barons and people generally, acknowledging the constitutional liberties of his subjects and the fixed principles of law as against the arbitrary will of the king. (See Magna Charta.) Another famous charter was the Charter of the Forest, which mitigated the severities previously made possible under the forest laws. Similarly, the term has been applied to comprehensive documents embodying the chief constitutional rules or principles according to which a government is to be carried on. Royal charters are often granted to towns or corporations conferring certain privileges or exemptions, as for instance to chartered banking or other companies, or to institutions connected with education, arts, or science. But of course the rights of the sovereign are limited in this direction, and an act of parliament is often required to effect an end that would formerly have been secured by a charter from the crown. The term charter is very frequently given to a document by which land, or certain rights in land, is transferred from one person to another. Such charters are familiar from Anglo-Saxon times downwards, land held by charter being originally known as *book-land* (*bócland*) to distinguish it from the *folk-land* (*folc-*

land) or public land. In Scots law a charter is the written evidence of a grant of heritable property made under the condition that the grantee shall annually pay a sum of money or perform certain services to the granter. See Bishop Stubbs's Select Charters and other Documents illustrative of English Constitutional History; Kemble's Codex Diplomaticus Ævi Saxonici; Round's Ancient Charters, Royal and Private; &c.

CHARTERHOUSE, a celebrated English public school and charitable foundation or hospital in the city of London. The site, Charterhouse Square, was originally bought for a public burial-place during the great plague of 1349 by Sir Walter Manny. In 1370 Manny and Northburgh, bishop of London, built and endowed a monastery in this place for Carthusian monks (hence the name, a corruption of the French word *Chartreuse*—see CHARTREUSE). After its surrender to Henry VIII. it passed through several hands, but was at last bought of the Earl of Suffolk by Thomas Sutton for £13,000. He founded and richly endowed a hospital, consisting of a master, preacher, head schoolmaster with forty-four boys, and eighty decayed gentlemen pensioners, together with a physician and other officers and servants of the house. Eighty pensioners are still maintained by the institution, each receiving food and lodging, and an allowance of about £36 a year. The pensioners or 'poor brethren' must be over fifty years of age, bachelors, and members of the Church of England. In 1872 the school was removed to new buildings near Godalming in Surrey. The Merchant Taylors' School acquired the old school premises, and at once erected new premises in their place. The hospital department of the Charterhouse still remains in the old buildings. There are a number of valuable exhibitions and scholarships to be competed for by the pupils of the school, which has a very high reputation. Many lads are educated there other than the scholars properly so-called. Among famous old pupils are Addison, Steele, John Wesley, Grote, Thirlwall, Havelock, Thackeray, Prof. Jebb, &c.

CHARTER-PARTY is a contract executed by the freighter and the master or owner of a ship, containing the terms upon which the ship is hired to freight. The masters and owners usually bind themselves, the ship, tackle, and furniture, that the goods freighted shall be delivered (dangers of the sea excepted) well-conditioned at the place of the discharge; and they also covenant to equip the ship complete and adequate to the voyage. The charterer is bound to furnish the cargo at the place of lading and to take delivery at the port of discharge within specified periods called *lay days;* and penalties are annexed to enforce the reciprocal covenants.

CHARTIER, ALAIN, a French poet and moralist, born, it is supposed, at Bayeux about 1386. He was educated at the University of Paris, and was appointed by Charles VI. clerk, notary, and secretary of the royal household—posts which he held under Charles VII. His contemporaries considered him the father of French eloquence. Although far from being handsome, he received one day while asleep a kiss from Margaret of Scotland, wife of the dauphin, who explained her conduct to the surprised by-standers by saying that it was not the man she kissed but the mouth whence flowed so many golden words. He died in 1449. His poems are often graceful and nervous, and his vigorous prose contains many fine thoughts and prudent maxims. The first edition of his works which bears a date is that of 1489; the most esteemed that of 1617 (4to).

CHARTISM, CHARTISTS. The reform bill passed in 1832 failed to give satisfaction to the extreme class of liberal politicians, who would have reduced the franchise to a lower standard, and in some cases been content only with universal suffrage. To the large body of the working-classes the reform brought, primarily at least, no additional advantages, and this circumstance was turned to account by many demagogues, who urged on the people the idea that they had been betrayed by the middle classes, and their interests sacrificed. Various circumstances contributed to foster this notion and secure its ready acceptance with the humbler classes of the community. The most prominent among these were the new poor law of 1835, the working of which occasioned great dissatisfaction; the period of great depression which about this time began to set in in the commercial world; and a succession of bad harvests, which aggravated greatly the sufferings of the people. In process of time these various elements of discontent came to a head, and assumed a definite form. The popular belief ascribed all its misfortunes to the misconduct of government, and a defective political representation. The extension of the franchise was held forth as a universal panacea for the evils under which the people were labouring. In 1838 the famous 'charter,' or 'people's charter,' was prepared by a committee of six members of Parliament and six working men. It comprised six heads, namely:—1. Universal suffrage, or a right of voting conferred on every male of twenty-one years of age, of sound mind, unconvicted of crime, and a native of the United Kingdom, as well as to every foreigner possessing the same qualifications, who had been resident in this country for more than two years. 2. Equal electoral districts. 3. Vote by ballot. 4. Annual Parliaments. 5. No other qualification to be necessary for members of Parliament than the choice of the electors. 6. Members of Parliament to be paid for their services. Immense meetings were now held throughout the country, numbering sometimes upwards of 100,000, and popular excitement mounted to the highest pitch. Physical force likewise was frequently advocated as the only effectual means for the masses obtaining satisfaction of their demands. An association calling itself the National Convention was embodied, and commenced its sittings in Birmingham in May, 1839. In June of the same year a petition in favour of the charter, signed ostensibly by nearly 1,300,000 persons, was presented to the House of Commons, which refused to take it into consideration. The feeling of exasperation among the Chartists increased, and in November a riot took place at Newport, in which ten persons were killed and great numbers wounded. A new association, in which the well-known Feargus O'Connor took the lead, was organized at Manchester in 1840. In 1842 great riots took place in the northern and midland districts of England, and these, though not directly caused, were nevertheless encouraged and promoted by the Chartists. The last great outbreak of Chartism was in 1848, when the revolutionary zeal which the French revolution of February had stirred up throughout Europe made its impression in Britain, though in a much less formidable degree. In London a great demonstration took place, but the precautions taken by governmment in enrolling special constables and making other preparations for defence daunted the minds of the agitators. A somewhat serious riot broke out in Glasgow, and other disturbances likewise arose in various places, but were all promptly suppressed. From that period Chartism gradually declined, and for a considerable time has been extinct as such. Some of the causes of its dissolution may be found in the repeal of the corn laws in 1846, and the marked improvement in the comfort and well-being of the working-classes which followed.

and is attributable in some degree to the effects of that important measure. The general spread of more liberal views in later times has also had its effect, leading to the adoption of the ballot and the extension of the franchise. The more advanced section of the party is now represented by those who hold republican or socialistic opinions.

CHARTRES (anciently *Autricum, Civitas Carnutum*), a city, France, capital of the department Eure-et-Loire, 49 miles s.w. Paris, situated on the slope of a hill, at the foot of which flows the Eure, and partly inclosed by walls and ditches, surrounded by ramparts planted with trees, which form an agreeable promenade. Most of the houses are built of wood and plaster, and have their gables toward the street. The streets of the lower town are narrow and crooked, and so steep in some parts as to be inaccessible to carriages. There are several public squares, one of which is of great extent. The only public buildings of note are the cathedral, the church of St. Père, contiguous to a huge barrack, once a Benedictine abbey; and the obelisk to the memory of General Marceau. The cathedral, one of the most magnificent in Europe, is rendered conspicuous by its two spires, one of which is 403 feet high, surmounting the hill on which the city stands. It has 130 windows filled with painted glass of admirable workmanship; and in its chair Henry IV. was crowned in 1594. Chartres is the seat of a bishopric, communal college, seminary, and agricultural society; and has two hospitals, a cabinet of natural history, botanical garden, and a public library. Manufactures—woollen, hosiery, hats, earthenware, and leather. A large trade is carried on in grain, wool, cattle, game, clover-seed, and wood. The largest weekly grain-markets in France are held here. Chartres was the capital of the Carnutes, and considered the capital of Celtic Gaul at the time of the Roman invasion. Towards the end of the eleventh century it was fortified, and in 1445 St. Bernard preached in its cathedral the first crusade. Pop. (1896), 19,213.

CHARTREUSE, the name given to any monastery of the Carthusians, whose original house, still known as the Grande Chartreuse, was established about 1084 in south-eastern France, some distance to the north-east of Grenoble, 3280 feet above sea-level. 'Chartreuse' is said to be a modification of 'Chartrousse', the name of the site selected for the first monastery. The monks of this monastery manufacture the well-known liqueur of the same name. See CARTHUSIANS and CHARTERHOUSE.

CHARTUM. See KHARTOOM.

CHARYBDIS, a daughter of Poseidōn and Gæa, whom Zeus, on account of her insatiable rapacity, hurled into the sea, where she became a whirlpool, and swallowed up every ship that approached. This mythological fiction was occasioned by the whirlpool in the Sicilian Sea, which was the more dangerous to inexperienced navigators, because in endeavouring to escape it they ran the risk of being wrecked upon Scylla, a rock opposite to it. Charybdis is no longer dreadful to navigators, who, in a quiet sea, and particularly if the south wind is not blowing, cross it without danger. Its present names are *Calofaro* and *La Rema*. The earthquake of 1783 is said to have much diminished its violence.

CHASE, SAMUEL, one of the signers of the American Declaration of Independence, was born April 17, 1741, in Somerset county, Maryland. His father, a learned clergyman, instructed him in the ancient classics, and subsequently placed him at Annapolis as a student of law. He was admitted to the bar at the age of twenty. His talents, industry, intrepidity, imposing stature, sonorous voice, fluent and energetic elocution, raised him to eminence in a very few years. Having become a member of the colonial legislature, he distinguished himself by his bold opposition to the royal governor and the court party. He took the lead in denouncing and resisting the famous stamp act. His revolutionary spirit, his oratory and reputation, placed him at the head of the active adversaries of the British government in his state. The Maryland Convention of the 22d of June, 1774, appointed him to attend the meeting of the general congress at Philadelphia in September of that year. He was also present and conspicuous at the session of December following, and in the subsequent congresses during the most critical periods of the revolution. That of 1776 deputed him on a mission to Canada along with Dr. Franklin, Charles Carroll of Carrollton, and the Rev. John Carroll, afterwards Catholic archbishop of Baltimore. He signed the Declaration of Independence with promptitude, and was an active and able member of Congress almost throughout the war, at the end of which he returned to the practice of his profession. In June, 1783, the legislature of Maryland sent him to London as a commissioner to recover stock of the Bank of England, and large sums of money which belonged to the state. He remained in England nearly a year, during which time he put the claim in a train of adjustment. There he passed much of his time in the society of the most eminent statesmen and lawyers. In the year 1791 he accepted the appointment of chief-justice of the general court of Maryland. Five years afterwards President Washington made him an associate judge of the supreme court of the United States. Political cases of deep interest having been tried when he presided in the circuit courts, and his conduct having given much displeasure to the democratic party, he was impeached by the House of Representatives at Washington. The trial of the judge before the Senate is memorable on account of the excitement which it produced, the ability with which he was defended, and the nature of his acquittal. He continued to exercise his judicial functions with the highest reputation until the year 1811, in which his health failed. He expired June 19 of that year.

CHASIDIM, or PIETISTS, the name of a Jewish sect which appeared in the middle of the last century. Its adherents are strongly inclined to mysticism, depreciate the Old Testament and its ordinances, and deem themselves able to approach the Source of light by means of a virtuous life, prayer, and secret meditation. They have a great esteem for the Hogadas of the Talmud, the books of the Cabbala, and the writings of their own teachers, which are full of tales, extraordinary cures, and mystic interpretations, but also contain excellent moral precepts. The founder of the sect was Israel of Podolia, surnamed Baalschem (contracted into Bescht), from his supposed influence with God and the spiritual hosts, whom he could move by his prayers and amulets to grant whatever he desired. At the head of the sect are three superiors or Zaddiks, each of whom has a particular diocese or district allotted to him, and jurisdiction over all the Chasideans resident within it. They are most numerous in Russian Poland, Moldavia, Wallachia, and some parts of Galicia and Hungary, and are regarded with great antipathy by the orthodox Jews. Chasidim is also the name given to a sect which sprang up about the second century B.C. This party is credited with the origin of the revolt of the Maccabees, with combating the erroneous notions bred among the Jews by the study of Grecian philosophy, and with being the parent stock of the Pharisees.

CHASING, the art of cutting artistic or ornamental designs on metals. Figures on metal are often produced in relief by being punched out from behind, and sculptured or finished on the front with small chisels and gravers. It is this latter process that is properly called chasing, and the same term is applied to designs produced by hand-tools on more or less flat surfaces. See Enchasing.

CHASSEPOT RIFLE, a breech-loading rifle, named after its inventor, and adopted as the fire-arm of the French infantry in 1866, after the value of the Prussian needle-gun had been shown in the war between Prussia and Austria. It is not now in use, having been replaced in the French army by a much modified form of small-arms. It belonged to the same system as the needle-gun, but was believed to have sundry advantages over that weapon. It was considerably lighter than the needle-gun, the weight of the latter being 12 lbs., and that of the former less than 9. In accuracy, penetrative power, length of range, lowness of trajectory, and rapidity of fire, it was inferior to the Martini-Henry. To the needle-gun it was superior in length of range and lowness of trajectory, as was shown in the war of 1870, in which the French could open fire at the distance of 1500 paces, while the effective range of the needle-gun was only 400 to 500 paces. This superiority, however, was neutralized by the fact that its lightness and its large charge had the effect of producing great recoil and of heating the barrel. At the commencement of an action the men would open fire at long ranges, but before closing with the enemy the barrel of their piece was so heated that the weapon could hardly be handled. From the recoil and heating combined, the soldier was obliged to fire from the hip, so that his aim was not accurate; while after much firing the breech became clogged up.

CHASSEUR (French word signifying *hunter*), a name given to various sections of light infantry and cavalry in the French service. The cavalry were formed about the middle of last century, were trained specially in the use of fire-arms, and were chiefly employed as skirmishers and on outpost duty. There is scarcely any difference between them at present and the ordinary light horse. The chasseurs d'Afrique were raised for service in Algeria, and mounted on Arabian horses. The infantry (chasseurs à pied) were meant by their originator, the Duke of Orleans, brother of Louis Philippe, to act as marksmen. They have been considerably strengthened, and form the majority of the French light infantry.

CHASTELARD, or **Châtelard, Pierre de Boscobel de**, celebrated for his infatuated passion for Mary, queen of Scots, was born in 1540 in Dauphiné. He was a nephew on his mother's side of the Chevalier Bayard, possessed a handsome figure, considerable skill at tilting and verse-making, and the various accomplishments that go to make up a gallant troubadour. From his connection with the house of Montmorency he had access to the court of Francis II., where he had occasion to see the beautiful Mary Stuart. He fell madly in love with her, and poured forth his admiration in innumerable poems. He figures as one of her escort on her return to Scotland after the death of her husband (1561). He had to return to France after this pleasing duty was performed, but on the first opportunity he was again in Scotland (1562). Mary gave him a very gracious welcome, answered, it is said, a poem dedicated to her, and allowed him to accompany her singing with his flute. John Knox does not hesitate to charge the queen with conduct towards the gallant scarcely seeming in an honest woman. Be this as it may, Chastelard had the temerity one night to invade the royal bed-chamber (Feb. 12, 1563). He was discovered, and ordered by the queen to quit the kingdom. Shortly after, however, he again concealed himself in a recess in her bed-room at Burntisland, where Mary had halted on her journey to St. Andrews. While she was being undressed he rushed out and implored the queen's mercy. For this offence he was tried publicly at St. Andrews and forthwith hanged, the queen resisting all appeals for pardon. Mr. Swinburne has written a tragedy on Chastelard.

CHASTELER, John Gabriel, Marquis of, grandee of Spain of the first rank, Austrian master of ordnance or general of artillery, military governor of Venice, descended in a collateral line from the dukes of Lorraine, was born in 1763, and received his first education at Metz in the Collége de Fort. In 1776 he entered the Austrian service. After having served against the Turks, by whom he was severely wounded, he displayed his zeal for the house of Austria in the disturbances in the Netherlands. In 1796–97 he was employed in the negotiations of his court in Poland and Russia; was afterwards with Suwaroff in Italy, where he distinguished himself in several engagements with the French armies. In 1808, with Hormayr, he was the soul of the famous insurrection in the Tyrol, and all the political as well as military events which were connected with it. Napoleon, enraged at the surrender of 8000 French and Bavarians at Innsbruck, issued a proclamation at Enns, in which 'a certain Chasteler who calls himself a general in the Austrian service, but who is the leader of a band of robbers, and the author of the murders committed upon the French and Bavarian prisoners, as well as the instigator of the Tyrolese insurrection,' is declared an outlaw, and ordered to be brought before a court-martial and shot within twenty-four hours. The Emperor Francis commanded that an order which violated all international laws, and which was the more censurable as Chasteler had taken particular care of the prisoners and the wounded, should be met by retaliation. The Bavarian army, under the command of the Marshal-duke of Danzig, entered Tyrol. Chasteler fearlessly encountered it, but his army was routed on the 13th of May. After the close of the war he received several appointments, and in December, 1814, was made governor of Venice, where he died, May 7, 1825.

CHASTELET Gabrielle Emilie Breteuil, Marquise du, of an ancient family in Picardy, born in 1706. She was taught Latin by her father, Baron Breteuil, and was as well acquainted with that language as Madame Dacier; but her favourite study was mathematics. She had a sound judgment and much taste, loved society and the amusements of her age and sex, but after the publication of the Philosophical Letters by Voltaire had roused the Jesuits' ire against him, she abandoned all these pleasures, and in 1733 retired with him to the dilapidated castle of Cirey, situated in a dreary region on the borders of Champagne and Lorraine. She embellished this residence, formed a library, collected instruments, &c. Cirey was often visited by the learned,—for instance, by Maupertuis, John Bernouilli, &c. Here the marchioness learned English of Voltaire in the space of three months, and read with him Newton, Locke, and Pope. She also wrote an analysis of the system of Leibnitz, and translated Newton's Principia, with an algebraic commentary. Voltaire lived six years with her at Cirey, where they employed their time in the study of science, and in getting up lovers' quarrels for the pleasure of patching them up again. At the end of this time she went to Brussels to prosecute a lawsuit, which was terminated by an advantageous compromise, brought about by Voltaire. She also carried on a correspondence with the German philosopher Wolf until her death. Her Traité de la Nature du Feu obtained the prize of the

Parisian Academy of Sciences, and is published in their collections. Her husband, the Marquis du Chastelet Lomont, was high-steward of King Stanislaus Lesczinsky at Lunéville. The marchioness died at Lunéville in 1749.

CHASUBLE, the uppermost robe worn by a priest in celebrating mass. It originally covered the whole person from head to foot, with no holes for the arms, and was called, it is said, for this reason, *casula* (Italian, little house). Its shape has been gradually modified till it has now assumed the form of a vestment passed over the head, hanging down in an oblong form before and behind, and leaving the arms free. It is usually of very rich materials.

CHÂTEAUBRIAND, FRANÇOIS AUGUSTE, VICOMTE DE, a celebrated French author and politician, was born at St. Malo in Brittany, September 4, 1768. His father was Auguste de Châteaubriand, lord of the manor of Combourg, and he was the youngest of a family of ten, of whom only four sisters and an elder brother reached maturity. His original destination was the French navy, and he studied first at the College of Dol, and afterwards at that of Rennes; but he appeared to have no special vocation for the sea, nor indeed for any of the professions. Latterly he made up his mind in favour of the church, whereupon he was sent to study at Dinan. His life here was rather an indolent one, made up chiefly of day-dreams and desultory studies. He was soon, however, summoned from this to a more active sphere, by receiving the appointment of sub-lieutenant in the regiment of Navarre. At the commencement of the revolution he was in Brittany, and hurried into Paris to witness the great commotions then taking place there. In the spring of 1791 his ardent and enthusiastic spirit led him to join an expedition to America for the purpose of exploring its arctic regions, and discovering the north-west passage. He crossed the Atlantic, landed at Baltimore, and proceeded to Philadelphia, where he had an interview with Washington. In the course of his wanderings in America he one day fell in with an English newspaper, which recounted the flight of Louis XVI. and his arrest at Varennes. The chivalrous spirit of Châteaubriand was stirred, and he conceived himself bound in honour to return to France to assist in succouring the fallen dynasty.

Almost immediately on his return he married Mdlle. de Lavigne, but in contracting this union he does not appear to have been animated by any strong feeling of affection. Very shortly after its celebration he quitted France and joined with other emigrants the Prussian army on the Rhine. At the siege of Thionville he was wounded in the thigh, and left for dead in a ditch. He was picked up by some attendants of the Prince de Ligne, and conveyed in a waggon to Brussels, and for a time he wandered about from door to door, vainly seeking admission. At last he found lodgings in the house of a barber, where he remained for a while, and then passed over to Jersey to join some Breton royalists. On arriving there he was in a delirious state, and continued for some months between life and death. In 1793, believing himself sufficiently convalescent to resume a military life, he crossed over to England, but his health again gave way, and friendless and penniless he continued for a time to wear out a miserable existence in London. He at last found means of earning a subsistence by giving lessons in French and executing translations for the booksellers. In 1797 he published here his Essai historique, politique et moral sur les Révolutions anciennes et modernes, considérées dans leurs Rapports avec la Révolution Française. It was not attended with much success in England, and attracted no notice whatever in France. The essay is pervaded by a strong sceptical spirit in religious matters, but its author's views on this subject were soon to experience a sudden and important change. The death of his mother in prison, and the accounts of her last moments transmitted to him by his sister, who herself was no more by the time her letter reached her brother, made a deep and lasting impression on the mind of Châteaubriand, and he became a firm believer in Christianity. In the ardour of his conversion he conceived and traced out a rough sketch of his Génie du Christianisme. In 1800 he ventured to return to France and take up his abode under an assumed name at Paris. Encouraged by the success of an essay on literature, contributed to the Mercure, he published in 1801 his Atala, which was afterwards introduced as an episode into his Génie du Christianisme. In the following year appeared his celebrated work, Le Génie du Christianisme, which may be said to have caused a religious reaction, and inaugurated a new period in the social history of France. The object of Châteaubriand was to demonstrate the superiority of Christianity over all other religions in a poetic and artistic, as well as moral and beneficial point of view. Though a work more brilliant than profound, it is unsurpassed for beauty of language and description and the eloquence of its impassioned appeals. The main charm indeed of the book may be said to lie in its beautiful imagery, drawn from external nature, and more especially from nature as exemplified in the glowing scenery of the New World. In this respect Châteaubriand may be said to have revived in French literature the description of natural scenery and objects which had long been almost unknown. His work attracted the attention and admiration of Bonaparte, and in Nov. 1803 he was appointed French minister for the Republic of the Valais. This office he resigned in 1804, on receiving intelligence of the execution of the Duke of Enghien, an act which not only cost him the favour of Napoleon, but required the good offices of powerful friends, including the Empress Josephine, to screen him from serious consequences.

In order to give life and tangible form to the theories propounded in the Génie du Christianisme, he commenced Les Martyrs, and to qualify himself for describing accurately the scenes amid which the poem is laid, he resolved to make a pilgrimage to the East. In July, 1806, he embarked at Trieste, traversed Greece, Asia Minor, and the Holy Land, then visited the north coast of Africa, and lastly embarked for Spain, through which he returned to France after a year's absence. In 1809 Les Martyrs was published, and is considered by many the best of his works. Some of the descriptions, such as the ancient forests of Gaul, the assemblies of the Christians in the catacombs, and the picture of Rome under the emperors, are given with marvellous beauty and effect. In 1811 appeared his Itinéraire de Paris à Jerusalem. The restoration of Louis XVIII. was hailed by him with enthusiasm, and a pamphlet entitled De Bonaparte et des Bourbons, published by him in 1814, was said by the king to have been worth to him an army of 100,000 men. On the second restoration he preserved the title of minister of state, but refused to take office along with Fouché. On the accession of Villèle to power Châteaubriand was appointed ambassador to Berlin, then to London, and in Sept. 1822 crossed the Alps to represent France at the Congress of Verona. In 1824 he was summarily dismissed from office at the instance of Villèle, and the indignation which he felt at such treatment made him join the ranks of the opposition, where in the columns of the Journal des Débats he fulminated attacks against government. On the accession of the Martignac ministry he again returned to office, and proceeded as ambassador to Rome, but resigned this appointment on Polignac becoming premier. On the revolution of 1830 he refused to take the oath of allegiance to Louis Philippe, and consequently forfeited his seat in the house of peers and a pension of 12,000 francs. In 1831 a new work appeared from his pen, entitled De la Restauration, et de la Monarchie élective, in which occurs the following singular avowal: —'I am a Bourbonist by honour, a royalist by reason and conviction, and a republican by inclination and character.' In the same year he published his Études ou Discours historiques sur la Chute de l'Empire Romain, a work of considerable merit, but exhibiting more of the imagination of the poet than the critical acumen of the historian. Owing to several pamphlets of a legitimist tendency issued by him, he was arrested in 1832, but defended by M. Berryer, and acquitted. In the latter years of his life he published an Essay on English Literature, a literal prose translation of Milton's Paradise Lost, and other works. He lived to witness the terrible scenes in Paris in June, 1848, and died on the 4th of July following, in the midst of the season of gloom and mourning which then enshrouded the capital. His memoirs of himself, on which he had been occupied for many years, appeared after his death, under the title of Mémoires d'outre Tombe. They possess a great interest, and contain many charming passages, but are at times disfigured by the ebullitions of personal vanity, which formed one of the principal weaknesses of Châteaubriand. He was an intimate friend of the celebrated Madame Récamier, whose feeling towards him amounted almost to worship, and up to his last days he reigned supreme in her salon of the Abbaye-au-Bois, where all that was illustrious then came together.

CHÂTEAUDUN, a town, France, department of Eure-et-Loire, 26 miles s.s.w. of Chartres, near the right bank of the Loire. Its streets are straight and terminate in a square, from which a complete view of the town may be obtained. The hôtel de ville and college buildings are deserving of notice. The old castle of the counts of Dunois overlooks the town. Châteaudun has manufactures of blankets and large tanneries, and some trade in agricultural produce. In the Franco-German war the town was captured by the Germans (18th Oct. 1870), who held it till 9th Nov., when they were driven out by the French; it was however, recaptured some few days after. Pop. (1896), 7460.

CHÂTEAU-GONTIER, a town, France, department of Mayenne, 19 miles s.s.e. of Laval, on the Mayenne, here crossed by a stone bridge, connecting the town with its principal suburb on the opposite side. Its houses are well built, but the streets are ill laid out. It has a court of first resort, an agricultural society, and communal college; and linen and serge manufactories, bleachfields, tanneries; with some trade in clover seed, linen, thread, iron, wood, wine, &c. Pop. (1896), 7227.

CHÂTEAUNEUF-DE-RANDON, a small town, France, department of Lozère, 12 miles n.e. Mende, on a hill. Pop. 3541. It was formerly fortified, and is celebrated for the four years' siege sustained by the English garrison in 1380, against the troops of Charles V., commanded by the chivalrous Duguesclin. During this siege the English governor, who had been hard pressed, promised to surrender to Duguesclin at the expiry of fifteen days, if no succour arrived. Before the expiry of the time agreed on Duguesclin died, when his successor summoned the governor, who replied that he had given his word to Duguesclin, and would yield to no other. Informed of the hero's death, he said, 'Then I will carry the keys to his tomb.' Accordingly the governor sallied forth with the garrison to Duguesclin's tent, and on his bended knees laid his sword and the keys of the town on the bier. In 1820 a simple commemorative monument was erected at the hamlet of Bitarelle, on the spot where this event occurred.

CHÂTEAUROUX, a town, France, capital of the department of Indre, 144 miles s.s.w. of Paris, in an extensive plain, left bank of the Indre. It has straight, broad, and tolerably well-paved streets, and spacious squares, with a public garden, and some fine promenades. The cloth manufactures, in which the wools of Berry are almost exclusively used, are extensive, employing about 2000 workmen. Cotton hosiery, woollen yarn, tiles, paper, and parchment are also made; and there are tanneries and dyeworks. There is likewise a considerable trade in grain, wine, iron, wool, poultry, and cattle. The town owes its origin to a castle built in 950 by Raoul le Large, of Déols, still in a tolerable state of preservation. It was considerably extended in the reign of Louis XIII., who constituted it a duchy in favour of the descendants of Henry II. of Bourbon, prince of Condé. Charles of Bourbon sold it to Louis XV., who conferred it on one of his mistresses, at whose death it returned to the crown. During the revolution of 1793 it was called Indreville. Pop (1896), 26,863.

CHÂTEAU-THIERRY, a town, France, department of Aisne, on the right bank of the Marne, 38 miles s.s.w. of Laon, with 7015 inhabitants. It occupies the side of a hill, whose rocky summit is crowned by the ruins of the old castle of Thierry, said to have been built by Charles Martel in 730. It is the birthplace of La Fontaine (to whom a fine marble statue has been erected), and was the scene of several conflicts during the campaign of 1814. On the 9th September, 1870, it was occupied by the Germans, and became a few days later the temporary head-quarters of the Emperor. It possesses a court of primary resort and a communal college, and has manufactures of linen and cotton twist, and a trade in grain, wool, and cattle.

CHÂTELET was anciently a small chateau or fortress, and the officer who commanded it was called *châtelain*. The word is a diminutive of *château*, formed from *castellum*, a diminutive of *castrum;* or from *castellatum*, a diminutive of *castellum*, castle. The term, in later times, has been applied to certain courts of justice, established in several cities in France. The Grand Châtelet, in Paris, was the place where the presidial or ordinary court of justice of the prévôt of Paris was kept, consisting of a presidial, a civil chamber, a criminal chamber, and a chamber of police. The term signified the same at Montpellier, Orleans, &c. When Paris was confined to the limits of the old city (*cité*), it could be entered only by two bridges (Le Petit Pont and Le Pont au Change), each of which was fortified with two towers —a smaller one in the wall, facing the city, and a larger one before the bridge, towards the country. These two exterior turrets were the Grand and Petit Châtelet. The tradition that the Grand Châtelet was built by Julius Cæsar, though adopted by some, is not well supported; but it is certain that the great tower was standing as early as the siege of the city by the Normans (885). The Grand Châtelet was the castle of the counts of Paris, and therefore the seat of all the royal courts of justice within the city and county, and also of the feudal court. The city had no proper jurisdiction whatever; its bailiff or provost (*prévôt*) was appointed by the king, and was president of the court (though only nominally, because he had no voice in the judgments), and, by virtue of his office, leader of the nobility. The office of provost of the merchants (*prévôt des marchands;* in other cities, *maire*), established before the former, and afterwards united with it for a time, was finally separated from it in 1388. The business of the Châtelet was transacted by the deputies of the bailiff (*lieutenants*), of whom there were five, three for civil causes, one chief judge of criminal cases, and a lieutenant-general of police (*lieutenant-général de la police*). The latter, indeed, was minister of police for the whole kingdom, and the extent of his functions and power, particularly after the new arrangement made by the celebrated d'Argenson under Louis XIV., rendered him one of the most important officers of the state. In the Châtelet, however, he held only the fourth place. The whole court of justice was composed of fifty-seven counsellors, with thirteen state attorneys, and a multitude of subalterns, as sixty-three secretaries or *greffiers*, 113 notaries, 235 attorneys, &c. All these offices were sold. The place of the first officer of the civil chamber was rated at 500,000 livres; that of a notary at 40,000 livres. The Châtelet was first in rank after the supreme courts (*cours souveraines*).

CHÂTELET, MARQUISE DU. See CHASTELET.

CHÂTELLERAULT, a town of France, department Vienne, 20 miles N.N.E. of Poitiers, pop. 20,014 in 1896. It stands on the right bank of the Vienne, which here becomes navigable, and is a place of some antiquity, having once been the capital of a duchy which, in 1548, was bestowed by Henry II. on the Earl of Arran, regent of Scotland, and still gives a title to his descendant, the Duke of Hamilton. The old walls and fortifications of the town have been removed and the site converted into promenades. There are here manufactures of cutlery, hardware, jewelry, lace, &c., and a good trade.

CHATHAM, a parl. and mun. borough, naval arsenal, and seaport of England, county Kent, on the Medway, about 33 miles by rail from London, practically forming one town with Rochester. As a parl. borough it includes Gillingham and New Brompton, and returns one member. Until a recent period a great portion of the town was irregular and ill built, but considerable improvements have now been carried out, and are still in course of progress. The great features of Chatham are the naval and military establishments here or in the immediate vicinity. The dockyard was founded by Queen Elizabeth previous to the period of the Armada, and during this reign Upnor Castle, on the left bank of the Medway, was erected to protect the dock and shipping. Despite the fire from the castle, however, in 1667, Van Ghent, a vice-admiral of De Ruyter's, succeeded in breaking the chain stretched across the river, burned and sunk several ships, and retired bearing off the war-ship, the *Royal Charles* as a prize. Subsequently the fortifications were greatly strengthened and enlarged, but the great increase in the power of modern ordnance having rendered parts of the works of little value, a number of out-lying forts have had to be built. With its modern extensions the royal dockyard now extends for about two miles along the river, and is most thoroughly equipped for the building, fitting out, and repair of war-vessels. Among recent additions are three basins for iron-clad war-ships, with a total area of about 75 acres. One of these, the repairing basin, has an area of 22 acres, and is connected with four dry-docks. It has 3500 feet of wharfage, is 80 feet wide at the entrance and about 30–32 feet deep at high water. The largest or fitting-out basin has a water area of 33 acres, with 5800 feet of wharfage, and a depth of 30 feet. From it the heaviest warships fully equipped are able to proceed direct to sea. The factory basin (20 acres area) is intended for fitting vessels with their engines, &c. The engine factories and machine works on the S. side of this basin are about 2500 feet long, and occupy about 14 acres. The cost of these works was nearly £3,000,000. The largest class of iron-clads are built here. There are several covered slips for building ships upon, the iron roofs of some costing £10,000. The rope-house has a length of 1200 feet; there are great saw-mills, and the forges turn out armour plates, anchors, and other articles required for the battle-ships of the present day. In short, all the requisites of a great naval station are here on the most complete scale. The military establishments include extensive infantry barracks, and barracks for the royal marines; the head-quarters of the royal engineers, arsenal and park of artillery, hospitals, &c. The whole is surrounded by a very extensive system of fortified works, rendering Chatham a place of great strength. The old convict prison has been partly pulled down and replaced by naval barracks. Pop. (1891), mun. bor., 31,657; parl. bor., 59,210; (1901), 40,753 and 78,746.

CHATHAM, a town of Canada, prov. Ontario, on the Thames, 11 miles N. of Lake Erie, with manufactures of machinery, woollens, &c., and a trade in lumber. Pop. (1891), 9052.

CHATHAM, WILLIAM PITT, EARL OF, one of the most illustrious statesmen of Britain. Integrity, disinterestedness, and patriotism were united in him with indefatigable industry, promptitude, and sagacity. His speeches were bold and sublime, and his influence over the minds of his audience was irresistible. His ease and dignity, fine voice and masterly gesticulation (in which even Garrick allowed him to be his superior), prepossessed his hearers in his favour, while the perspicuity and power of his arguments carried conviction. He was the son of Robert Pitt of Boconnoc, in Cornwall, born in 1708, and educated at Eton and Oxford. On quitting the university he became a cornet in the blues, and in 1735 represented the borough of Old Sarum (which was the property of his family) in the House of Commons, where he attracted universal notice. He was a powerful opponent of Sir Robert Walpole, who revenged himself by taking away his commission. In January, 1741, he delivered the speech reported by Johnson for the Gentleman's Magazine, beginning, 'The atrocious crime of being a young man, which the honourable gentleman has with such spirit and decency charged upon me, I shall neither attempt to palliate nor deny.' But it is probable that there is more of Johnson than of Pitt in it. In 1744 he received, on account of his patriotism, a legacy of £10,000 from the Duchess of Marlborough, and at a later period a considerable estate was bequeathed him by Sir W. Pynsent. He had been appointed gentleman of the bedchamber to the Prince of Wales, but resigned this place in 1745; became in 1746 vice-treasurer of Ireland, paymaster-general of the army, and member of the privy-council. In 1755 he resigned the paymaster's office. In 1756 he was appointed secretary of state, but was dismissed in the same year on account of his opposition to the Hanoverian policy of George II. The nation, however, was enthusiastically attached to him, and the public discontent was so loudly manifested, that he was appointed secretary of state again in 1757. His great mind now revealed its full force. His ascendency was complete over the Parliament no less than in the ministry; he aroused the English nation to new activity, and in the space of a few years recovered the superiority over France, annihilating her navy, and stripping her of her colonies. In 1760 he advised the declaration of war against Spain while she was unprepared for resistance, as he foresaw that she would assist France. The elevation of England on the ruins of the house of Bourbon was the great object of his policy. But his plans were suddenly interrupted by the death of George II. George III. was prejudiced against Pitt by his adversary, the Earl of Bute, a statesman of limited views. Pitt therefore resigned his post in 1761, only retaining his seat in the House of Commons. On his retirement his wife was created Baroness Chatham. The thanks of the city of London were presented to him in a public address, and an inscription in his honour was ordered to be placed on Blackfriars' Bridge. In 1762, when Spain formally allied herself with France, Pitt urged the continuance of the war, by which both states would perhaps have been totally exhausted; but peace was concluded by the opposite party in 1763. Pitt uniformly supported the cause of the people. Foreseeing the separation of the American colonies from the mother country, if the arbitrary measures then adopted should be continued, he advocated, especially in 1766, a conciliatory policy, and the repeal of the stamp act. In the same year he was invited to assist in forming a new ministry, in which he took the office of privy-seal, and was created Viscount Burton, Baron Pensent, and Earl of Chatham. In 1768 he resigned, as he found himself inadequately seconded by his colleagues. In the House of Lords he continued to recommend the abandonment of the coercive measures employed against America, particularly in 1774; but his warning was rejected, and in 1776 the colonies declared themselves independent. In vain did he renew his motion for reconciliation in 1777; in vain did he declare the conquest of America impossible. April 7, 1778, though labouring under a severe illness, he repaired to the house, to attack the unjust and impolitic proceedings of the ministers towards the colonies. At the close of his speech he fainted and fell backwards; he was conveyed out of the house, and afterwards removed to his country-seat at Hayes, in Kent, where he died, May 11. The Parliament annexed an annuity of £4000 to the earldom of Chatham; his debts were paid, and he was honoured with a public funeral, and a magnificent monument in Westminster Abbey. Another was erected in 1782 in Guildhall. The sentiments of Lord Chatham were liberal and elevated, but he was haughty, and impatient of contradiction, and perhaps exhibited too marked a consciousness of his own superiority. His private was as estimable as his public character. No literary production of Lord Chatham, except one or two short poems, had appeared, until the publication by Lord Grenville, in 1804, of his 'Letters' to his nephew, afterwards the first Lord Camelford, which contain much excellent advice to a young man, clothed in easy and familiar language, and reflect equal honour on the author's head and heart.

CHATHAM ISLANDS, a group of three islands in the South Pacific Ocean, belonging to New Zealand. The largest, or Chatham Island, lat. (s. point) 44° 7′ s.; lon. 176° 49′ E., is between 300 and 350 miles E. from the N.E. coast of the Middle Island of the New Zealand Islands, and is about 38 miles long and 25 broad. The other islands are Pitt Island, 12 miles long by 8 broad; and Ranga Tira, a mere rock. The harbour of Waitangi, on the W. side of Chatham Island, is much frequented by whaling vessels, which there supply themselves with fuel, provisions, and water. There are few hills in the island, and the highest does not exceed 800 feet. The soil is in many places fertile, and crops of potatoes and wheat have been successfully and extensively cultivated and exported. Turnips, cabbages, pumpkins, and tobacco are also successfully cultivated. The creeks and shores abound in fish, many of them excellent; sharks of formidable size are numerous. The original inhabitants, now nearly extinct, are a cheerful and good-natured race. About the year 1830 they amounted to about 1200, but they now number little more than 30. The destruction of this unfortunate people is attributed to the cruelty and tyranny of the New Zealanders, a number of whom migrated to the island in 1836, and by the superior energy and ferocity of their character soon became masters of the inoffensive aborigines. The present population amounts to about 400, more than half of whom are Maoris. The Chatham Islands were discovered by Lieut. William Robert Broughton, of H.M. brig *Chatham*, and taken possession of by that officer in name of his Britannic majesty, Nov. 29, 1791.

CHATILLON-SUR-SEINE, a town, France, department of Côte d'Or, 45 miles N.W. of Dijon, on the Seine. It has a hôtel de ville, palace of justice, several old churches, a public library, hospital, college, and an old castle surrounded by a beautiful park, through which flows the Seine. It has also a court of first resort and of commerce; manufactures of cloth, serges, and linen; iron furnaces, forges, paper-works, tanneries, breweries, distilleries, &c. In 1814 a congress of the allied powers and France was held here. On the 19th Nov. 1870, Ricciotti Garibaldi made a dash at the town, and drove out the German troops who had occupied it. Pop. (1896), 4794.

CHATMOSS, an extensive morass, area about 6000 to 7000 acres, situated chiefly in the parish of Eccles, Lancashire. It is remarkable as being the scene of operations for reclaiming bog-land, first successfully carried out on a large scale in the end of 18th and beginning of the 19th century; also for offering one more field of triumph to George Stephenson, who carried the Liverpool and Manchester Railway over it after all other engineers had declared the feat impossible. In reclaiming the bog it was divided into strips of about 70 yards broad, but varying in length, by open parallel drains 4 feet wide at top, 4 feet deep, and 14 inches wide at bottom. Covered sod drains were then made at a distance of 16 feet, and at right angles to the open drains, into which they discharge themselves. Those drains were 18 inches wide at top and 6 inches at bottom, having a depth of 3 feet. For the purpose of claying the bog, railways were laid in sections of convenient length along the strips, and wagons discharged their loads to the right and left of the rails, which were immediately afterwards transferred to a parallel line a few feet from the preceding one. Stephenson, thinking of the plan adopted by the labourers of wearing wide pattens, calculated that the principle might be applied to the railway. He spread branches of trees and hurdles interwoven with heather on the surface of the bog, and spread a thin layer of gravel over all; upon this sleepers and rails were laid in the ordinary way. Drains were cut at both sides of the line, and a conduit of old tar barrels placed end to end was formed under the line of rails.

CHATRE, LA, a town, France, department of Indre, 21 miles S.E. of Chateauroux, right bank of Indre. Its streets are irregular, but the general aspect of the town is agreeable. It has a pretty parish church with modern stained glass; a fine marble statue of George Sand; a square tower, part of the old chateau; and a public fountain; a court of first resort, and communal college; manufactures of cloth, leather, and a considerable trade. Pop. (1896), 4850.

CHATSWORTH, the celebrated estate of the dukes of Devonshire, situated in the parish of Edensor, in Derbyshire. It was among the domains given by the Conqueror to his natural son William Peveril. It was purchased in the reign of Elizabeth by William Cavendish, who commenced to build a mansion on it, which was completed by his widow, the Countess of Shrewsbury. The present building was nearly completed by the first Duke of Devonshire, and a new wing was added by the sixth duke. The façade is 720 feet long, or with the terraces, 1200 feet. The mansion forms a square, with an inner court, and is remarkable for the collections of pictures and statues it contains. The park is about 11 miles in circumference, diversified by hill and dale. The grounds have been laid out by Loudon and Sir J. Paxton. The conservatory covers nearly an acre, measures 300 by 145 feet, and is 65 feet high. In the old building Mary Stuart was imprisoned for thirteen years. Hobbes the philosopher lived for some time here.

CHATTAHOOCHEE, a river, United States, Georgia and Alabama, rising in the Appalachian Mountains, about lat. 34° 40′ N.; lon. 83° 30′ W., and flowing first W. and then S., and forming, for a considerable distance, the boundary between the above states. In its lower course, after the junction of the Flint River from the E., it is named the Appalachiola, and is navigable to Columbus in Georgia for steam-boats. Total course, about 550 miles.

CHATTELS, property movable and immovable, not being freehold. The word chattels is originally the same word with cattle, all property being reckoned in early periods by the number of heads of cattle possessed, or their equivalent. From the fact that cattle were reckoned by the head, it appears probable that they were called *capitalia* (from the Latin *caput*, the head), which became contracted by syncope into *captalia*, and then *catalia*, whence the legal term *catalla*, and our chattels and cattle. Hence the word chattels signified originally only movable property, but in course of time came to be applied to all property not held in feudal tenure. Chattels are divided into real and personal. Chattels *real* are such as belong not to the person immediately, but dependently upon something. Any interest in land or tenements, for example, is a real chattel; so also is a lease, a rent for a term of years, an interest in advowsons, and so forth. Chattels *personal* are goods which belong immediately to the person of the owner, and include all movable property. Chattels usually pass to the executor, except such, for instance, as trees, which may not be severed from the freehold, and therefore pass to the heir.

CHATTERTON, Thomas, a youth whose genius, eccentricity, and melancholy fate have gained him much celebrity, was born at Bristol, in 1752, of poor parents. He had not yet learned to read when an old French musical work happened to fall into his hands, the characters of which excited his curiosity. His mother now taught him to read from an old black-letter Bible. When eight years old he entered a charity school—Colston's, where the workings of his genius lay concealed under the appearance of melancholy and incapacity. At about ten years of age he acquired a taste for reading, which became, from that period, a kind of ruling passion. His first work, a satire on a Methodist who had abandoned his sect from interested motives, was written at the age of 11½ years. From this time his taste was decided. His melancholy gave way to vivacity and vanity, and dreams of glory, fortune, and immortality. He became particularly fond of antiquities and antique expressions. At the age of fourteen he left school, and was articled as apprentice to a scrivener at Bristol. His father, who died before his birth, had accidentally obtained possession of a number of old parchments of the fifteenth century. Many of these were consumed in the family, but several fell into the hands of Chatterton, who after a few days declared that he had discovered a treasure. He then procured glossaries of the old dialects of the country, and in 1768, when the new bridge at Bristol was completed, he inserted a paper in the Bristol Journal, entitled A Description of the Friars' first Passing over the Old Bridge, taken from an Ancient Manuscript. He was then but sixteen years old. Upon being questioned as to the manner in which he had obtained it, he finally asserted that he was in the possession of several valuable old manuscripts, taken from an old chest (Canynge's Cofre) in Redcliffe Church. He had been engaged for a year in the composition of several poems, which he attributed to different ancient writers, particularly to one Rowley. In 1769 he ventured to write to Horace Walpole, who was then engaged upon his Anecdotes of Painters, giving him an account of a number of painters who had flourished in Bristol, which Chatterton pretended to have discovered along with several ancient poems in that city. Having received a polite answer he wrote a second letter, informing Walpole of his situation, and requesting assistance to enable him to follow his inclination for poetry. Walpole submitted some of the poems sent in a second letter to Gray & Mason, who declared them to be spurious, and he returned them to Chatterton without taking any further notice of him. Discontented with his situation, he obtained a release from his apprenticeship by threatening to put an end to his life, and went to London. The favourable reception which he there met with from the booksellers inspired him with new hopes. He wrote for several journals on the side of the opposition. He indulged the hope of effecting a revolution, and used to boast that he was destined to restore the rights of the nation. Failing to procure the rewards which he had expected for his exertions in favour of one party, he observed that 'he must be a poor author who could not write on both sides.' On this principle he acted; but prosperity did not attend his dereliction from principle. His situation daily became worse. Although extremely temperate, and often voluntarily confining himself to bread and water, he was frequently destitute even of these necessaries. What he gained by his labours he spent partly in presents for his mother and sisters, to whom he always held out the most splendid expectations, partly in public places of amusement, which he continued to visit under the appearance of easy circumstances. At last, after having been several days without food, he poisoned himself in 1770, when not yet eighteen years old. His works were more extensively read as the public became acquainted with the history of his misfortunes. The most remarkable are the poems published under the name of *Rowley*, which he composed at the age of fifteen years. They display a vigorous and brilliant imagination, fertility of invention, and often a deep sensibility. Among the poems which he published under his own name his satires deserve the preference. His prose writings are spirited. Prof. Skeat's edition of his poems is one of the best. See biographies by Dix (1837), Prof. Daniel Wilson (1869), and Prof. Masson.

CHATTERTON'S COMPOUND, a mixture of Stockholm tar, resin, and gutta-percha, one part of each of the former, and three parts of the latter. It is used in the construction of submarine telegraph cables, being laid on over the conducting wire in alternate layers with gutta-percha to form the insulator.

CHAUCER, Geoffrey, 'the father of English poetry,' born in London, probably about 1340; died there on the 25th of October, 1400. The date commonly assigned till lately for his birth was 1328, but all the evidence that there is to show on this matter points to a date considerably later. He was the son of a vintner named John Chaucer, a fact recently brought to light by the labours of Furnivall. Nothing is known of his education, and the earliest fact of his career that has been ascertained is that he is mentioned in the household book of the wife of Prince Lionel, second son of Edward III., in 1357. In 1359 he bore arms in France, and was taken prisoner at Retiers in Brittany, but he was ransomed the following year. The next mention of him occurs in 1367, when he is described as a *valettus* of the king, and from 1372 he is styled esquire. It is supposed that the marriage of Chaucer belongs to this period, but the whole circumstances are obscure. What alone is certain is that he received in 1374 a grant of £10 a year for life from the Duke of Lancaster in consideration of the good service which he and his wife Philippa had rendered the said duke. It is thought that this Philippa was one of the ladies-in-waiting to Queen Philippa. She may have been, as some think, a cousin of the poet, but there is good reason to believe that she was the daughter of Sir Payne Roet. These connections increased his favour at court, and in 1367 he received from the king a pension of twenty marks. In 1372 he was sent to Genoa as a commissioner to negotiate a commercial treaty. On returning after a year he was appointed in 1374 comptroller of the customs on wool, skins, and tanned hides in the port of London, an office which was sufficiently lucrative. He was now in tolerably affluent circumstances, was employed by the court in various services, and in 1382 was appointed comptroller of the petty customs in the port of London. In 1386 he was returned to Parliament as knight of the shire of Kent, but in the same year his fortunes fell with those of his patron, John of Gaunt. He was deprived of both his comptrollerships, and thus reduced to a condition of comparative want. Three years later he was again in favour. Though not restored to the offices he had formerly held, he became clerk of the king's works at Westminster Palace and elsewhere, with permission to appoint a deputy. In 1391 he lost this place, but about the same time he became a forester of North Petherton Park, Somersetshire. In 1394 he was granted an annuity of £20 for life by the king, and five years later Henry IV. added 40 marks to this, so that at his death his circumstances should have been quite comfortable. Chaucer's most celebrated work, which, although possibly begun in his earlier years, was certainly not all written till near the end of his life, is the Canterbury Tales. These are all in verse, except the Tale of Melibœus and the Parson's Tale. The work remains unfortunately incomplete. The Tales are distinguished for variety of character-painting and liveliness of description, and are marked alike by humour and pathos. In them, as in others of his works, Italian influence is clearly seen; and that Chaucer borrowed from Boccaccio is well known; yet, as Professor Hales remarks, 'For what is best in his best works he is debtor to no man'. Chaucer's principal works besides the Canterbury Tales (first printed by Caxton in 1475) are, The Boke of the Duchesse (1369), The Assembly of Foules (1374), Troylus and Cryseyde (1380–82), The Legende of Good Women (1385), The House of Fame (1386). He also translated Boethius, and wrote a treatise on the Astrolabe (1391). Several poems were formerly ascribed to him erroneously. The best editions of his works are that of Prof. Skeat (6 vols.) and the 'Globe' edition.

CHAUCI, an ancient Teutonic tribe, dwelling between the Ems and Elbe on the shore of the German Ocean.

CHAUDES-AIGUES (that is, 'warm waters'), a watering-place of France, in the department of Cantal, 28 miles E.S.E. of Aurillac. The warm springs rise in a volcanic mountain, and are so copious that the water is used from November to April in heating the town. Pop. (1896), 1650.

CHAUDET, Antoine Denis, French sculptor, was born at Paris, March 31, 1763. In his twenty-first year he obtained the first prize of the Academy, and went to Rome, where he studied the masterpieces of the ancients. On his return he became a member of the Academy. His first work was a bas-relief under the peristyle of the Pantheon. Among his other works are La Sensibilité, a young girl astonished at the motion of the sensitive plant, which shrinks from her touch; the statue of Cyparissa, &c. Chaudet also excelled as a painter, and in addition contributed to the Dictionary of the Academy. He died at Paris, April 19, 1810.

CHAUDIÈRE, a river of Canada, rising in Maine, near the sources of the Kennebec, and flowing north for 120 miles to join the St. Lawrence about 6 miles above Quebec. Between 2 and 3 miles above its mouth it forms the Chaudière Falls. Chaudière Lake is an expansion of the Ottawa river just above the city of Ottawa.

CHAULMUGRA (*Gynocardia odorata*), a tree of the order Bixaceæ, which grows in eastern countries, and from the seeds of which an oil is obtained that has been long known and highly valued in India and China as a remedy in skin diseases. The oil has been introduced into Great Britain, and is said to be useful in rheumatism, sprains, &c.

CHAUMONT, a town of France, capital of the department of Haute Marne, on a height between the Marne and the Suize, 145 miles S.E. of Paris by rail. It is well built, has a fine town-hall, courthouse, communal college, public library, church dating from the thirteenth century, the ruins of a castle belonging to the counts of Champagne, and an iron bridge of 50 arches on which the railway crosses the Suize. There are manufactures of gloves, cutlery, leather, woollens, sugar, &c.; and a trade in the iron and iron goods of the department. Here was signed, in March, 1814, a treaty between Great Britain, Russia, Austria, and Prussia, in which these powers pledged themselves to accomplish the overthrow of Napoleon and restore peace to Europe. Pop. in 1896, 13,428.

CHAUNY, a town, France, department of Aisne, on the right bank of the Oise, 19 miles W. by N. of Laon. It has manufactures of glass, sugar, chemicals, &c. Pop. (1896), 9927.

CHAUX-DE-FONDS, La, a town of Switzerland, in the canton, and 9 miles N.W. of the town of Neufchâtel, in a deep valley of the Jura. Chaux-de-Fonds and the neighbouring village of Locle are the chief centres of watch-making in Switzerland. Pop. (1895), 31,173.

CHAY-ROOT, or Choy-root, the roots of a small cinchonaceous plant of Hindustan, the *Oldenlandia umbellata*, extensively cultivated on the Coromandel coast. The roots yield a dye which is used as madder.

CHECK. See Cheque.

CHEDDAR, a village of England, in Somerset, 18 miles S.W. Bristol, in a picturesque situation, at the entrance of a deep gorge in the Mendip Hills. The church is a handsome structure, and there is also a Wesleyan chapel. The ancient market-cross is beautifully cut, of a hexagonal form, and was restored in 1878. The cheese of the neighbourhood has long been famous. (See Cheese.) Pop. of parish, 1941.

CHEDUBA, or Man-aung, an island in the Bay of Bengal, about 25 miles off the coast of Arracan, forming a township of Kyauk-pyu district, Lower Burma; area, 240 sq. miles; pop. 24,000. It is well wooded and fertile, but unhealthy. On the north-west coast inflammable gases are discharged in some quantity. The principal product is an excellent tobacco. Rice, indigo, pepper, are also produced; and petroleum is found. On it is a town of the same name.

CHEESE. Cheese is a product of the dairy resulting from the treatment of milk with an acid, which causes the coagulation of the albuminous matters, especially casein. On the European continent a considerable portion of the cheese is made from the milk of goats, or in some cases from ewes' milk; and in the United Kingdom ewe-milk cheese was not an uncommon article of diet at one time; but it is from cow's-milk that cheese is chiefly manufactured. Cheese is composed of water, casein, fat, sugar, and a variable quantity of common salt, and alkaline and earthy phosphates. An average sample of Cheddar cheese contains the following ingredients in the proportions given per cent:—Water, 34·38; casein, 26·38; fat, 32·71; sugar, 2·95; ash, 3·58.

The varieties of cheese depend upon the pasture of the cows, the mode of manufacture, and the after-treatment. Some districts, such as Cheshire and Gloucester, on account of the peculiar suitability of their pastures, have become associated with the cheese produced from them. The Ayrshire cow is generally admitted to be pre-eminently suited for the cheese dairyman, not only on account of the large percentage of casein contained in the milk, but because the smallness of the fat globules renders them less liable to be dispersed and lost in the whey during the stirring of the curd. One gallon of milk will usually produce one pound of cheese, so that the produce of a cow yielding 700 gallons of milk per season should be from 6 to 7 cwts. of cheese; but this is not often realized in practice, as cheese is seldom made during the entire milking period of the cow. The coagulation of the casein in the milk, which is the first stage in the manufacture of cheese, may be brought about in a natural manner by allowing the milk to stand until lactic acid has been formed from the sugar by the action of the lactic bacteria. The lactic acid acts upon the phosphates of the milk, and these in their turn act upon the casein, causing coagulation. By this spontaneous souring the casein alone is coagulated. In parts of Holland the coagulum or curd is obtained by the use of acids such as hydrochloric and acetic, but in the United Kingdom, and in most countries, *rennet* is employed. Rennet is an extract from the fourth stomach of a calf, preserved by the addition of a brine solution. The acid which acts upon the milk is peptic acid, a secretion from the peptic glands of the stomach. The process by which curd is obtained in this way is not yet understood, but a fermentation caused by some unorganized ferment is known to occur. The proportion of rennet required to coagulate a given quantity of milk depends upon the kind and quality of cheese which is desired. For making Cheddar cheese, about 4 ozs. of rennet extract is used to 100 gallons of milk.

Curd is the raw material used in the manufacture of cheese. The process of cheese-making generally consists in heating the milk and allowing it to ripen, and in some cases the ripening is hastened by the addition of sour whey or a bacterial culture. When the desired degree of acidity is obtained, the proper quantity of rennet is well mixed with the milk in a vat or tub and coagulation takes place. When a sufficient time has elapsed the curd is cut with knives in which the blades are set vertically and horizontally, so as to divide it evenly into small sections. The temperature of the whole is slowly raised, usually by steam in a jacketed vat, until the whey separates from the curd and can be run off. The curd is then placed upon a rack or drainer and afterwards put through a curd-mill and salted and pressed. It emerges from the press as cheese, and the cheese is bandaged and set to cure in a well-ventilated curing-room. The appliances used in cheese-making are cheese-vats, which are surrounded by a steam jacket for the regulation of the temperature and the cooking of the curd; drainers, curd-mills, chessets, and cheese-presses. The thermometer is in continual use, as success in making cheese largely depends upon the proper regulation of the temperature of the milk.

It is in the curing-room that the particular flavour of the cheese is developed by a ripening process, and it is just here that the cheese-maker has least control over his production. That the ripening of cheese is due to the presence of bacteria has been repeatedly proved by making cheese from milk which has previously been sterilized or pasteurized, in order to destroy the bacteria therein; and where this has been done the cheese, even at the end of several months, has remained practically unchanged in flavour and consistency. The addition of a disinfectant to the milk, sufficient to destroy the bacteria, has brought about the same result. The discoloration and swelling of cheese is in like manner due to the action of undesirable species of similar organisms. Several factors, such as the method of preparation, treatment of the curd, and the amount of water left in, affect the character of the cheese, but these are all subsidiary to bacterial growth, and affect the cheese chiefly by providing variation in the medium for the micro-organisms. Dairy bacteriologists are at present engaged in trying to isolate the particular species which predominate in producing the flavour of particular varieties of cheese, and it may be predicted that in the future the cheese-maker, by means of pure cultures of bacteria, will be able to exert the same control over the ripening of the cheese as the butter-maker at present exerts over the ripening of his cream. Professor Campbell of Leeds has attained considerable success in improving the uniformity of Cheddar cheese, and in obviating discoloration by the use of 'starters' or pure cultures of bacteria added to the milk. In the Transactions of the Highland and Agricultural Society, vol. x., 1898, he thus sums up the advantages of an artificial starter. 'The addition of sour-whey or old-milk starter to milk differs from the addition of pure culture starter to milk exactly as the sowing of uncleaned seed on a field differs from the sowing of cleaned seed. The sour-whey and old-milk starter may or may not be pure. The culture sent from the laboratory is always pure.'

There are different kinds of cheeses according to the methods of preparation and the predominance of one or more of the factors already mentioned. Cheeses are known as 'fat', 'half-fat' and 'lean', when made from full milk, half-skim milk, and skim milk respectively. Soft cheeses are not subjected to great pressure, and do not keep long. Hard, dry cheeses are intended for keeping, and when well salted will keep for years. Common British pressed cheeses are Cheddar, Cheshire, Derby, Dunlop, and double and single Gloucester. In making double Gloucester the curd is not broken or cut as in making Cheddar cheese, but skimmed and allowed to drain in a different manner. The best-known soft cheeses made in Britain are Stilton and cream cheeses. Stilton is a double-cream cheese in which the evening's milk is added to the morning's milk. Cream cheese is made from thick cream which has been allowed to drain in a perforated wooden box lined with muslin. Skim-milk cheese is made from skim milk from which the fat has been almost entirely removed. On the European continent, and in America and the British colonies, cheese is chiefly made in factories, as this system has been found to result in the minimum expense and the maximum uniformity of produce. The factory system is slowly gaining ground in the United Kingdom, particularly in Ireland, under government fostering. There can be no doubt that the extension of the factory system abroad, and more especially in the United States and Canada, is the chief cause of the very serious competition in dairy produce which the British farmer has now to face. That the competition in cheese-making will become greater is certain, for the dairying industry in Australia and New Zealand is only in its infancy, and the importation of cheese from these countries is sure to increase from year to year. Besides the cheese produced in the United Kingdom, of which only a small quantity is exported, a quantity of 2,603,608 cwts., valued at £5,886,546, was imported from abroad in 1897, while the quantity in 1898 was 2,339,452 cwts., the value being £4,970,242. The countries from which the cheese is chiefly obtained are, in the order of their importance, Canada, which supplies more than half the total, the United States, Holland, France, Belgium, and Australasia. During the twenty years from 1876 to 1896 the consumption of cheese per head of population of the United Kingdom has increased from 5·2 lbs. to 6·4 lbs., and the value per head of the quantity consumed has decreased from 2*s.* 7*d.* to 2*s.* 6*d.*

CHEIROMANCY, or PALMISTRY, the art of divining by inspection of the lines of the hand. The art was practised in India in the remotest ages; it was not unknown to the Greeks and Romans; in Europe, during the middle ages, it was in great repute, but latterly took refuge among the gypsies, who to this day find profit in the exercise of the art. Recently manuals of palmistry have been published both in France and England, and it has been to some extent a fashionable fad.

CHEIROPTERA, or BATS. This order is perhaps the most natural assemblage in the class of mammals. Its essential character is the possession of a *patagium*, or expansion of the integument of the body which connects the tail throughout its whole length to the hinder limbs as far as the ankle, and thence passes along the side of the body to the fore-limbs, which are greatly elongated, and give support and varied movement to the expansion (which is popularly called the wing) by means of the very long and slender digits. Other mammals, as some of the squirrels and the flying lemur, have the power of gliding through the air for some distance, but none of them have the power of sustained flight, nor are the anterior extremities modified in the same way as are those of the bats. The anatomical characters of the order are well seen in the accompanying plate. The bats approach most closely to the Insectivora, of which they may be regarded as an extremely modified section. A comparison of the skulls, figs. 5, 13, 14, 20, 22, will show that in general aspect these two orders resemble each other, and agree with the Carnivora (which see) in the hour-glass contraction which separates the cranial from the facial portions of the skull. But there is not the massive appearance, nor is there the same muscular development that we see in the latter. The vertebræ are broad, and as in the Lemurs and Insectivora the processes are not prominent. The head of the thigh-bone is articulated to the pelvis so that when the animal is resting on the ground the knee points upwards and backwards, and as a consequence the toes point backwards and slightly outwards, somewhat after the fashion of lizards. The fibula is rudimentary, so that in fig. 8 only the slender tibia or shin-bone is apparent, but an accessory bone or cartilage, *f*, springs from the side of the ankle and supports the edge of the patagium. The long and strong clavicles, *a*, are attached to the expanded head of the sternum, which shows a crest along the middle line, whereby, as in birds, an increased surface of attachment is provided for the powerful muscles which act on the wing; but, unlike birds, the scapula or shoulder-blade is also broad and has a strong keel. The humerus, *o*, is succeeded by the radius, *n*, which alone supports the wrist, *m*, the ulna being imperfect distally (at the end farthest from the body), so that in both extremities there is provision only for upward and downward movement, anything like rotation being checked. The thumb, *l*, consists as usual of two phalanges, the distal of which always supports a nail. The second digit, *k*, sometimes also supports a nail; but when the nail is absent, as is invariably the case with the other three digits, only two phalanges are present in the member. Three kinds of teeth are always present, incisors, canines, and molars. The favourite attitude of rest is hanging head downwards suspended by the hind-feet, which are made to turn in the same direction by the free rotation of the bones of the ankle. The intestine varies according to the diet of the animal, the stomach of the insectivorous group being of average size and pyriform shape, while the frugivorous group have a great pyloric, the blood-sucking Desmodus a very large cardiac dilatation. The sense of touch is wonderfully developed, as Spallanzani's experiment with blinded bats showed. (See article BAT, where we have given a popular account of the more common species.) Hearing is also acute.

The Cheiroptera are divided into two sub-orders, *Frugivora* and *Insectivora.* The Frugivora have all, with the exception of *Hypoderma*, a nail on the index finger as well as on the thumb; and the index has in all three joints. The crowns of the molar teeth are speedily ground flat, but when entire they are tuberculated and divided by a narrow longitudinal groove. No cutaneous appendages are developed in connection with either nose or ear. *Pteropus* is the most widely distributed genus belonging to this division, all the members of which are found in Eastern Africa, tropical Asia, and Australia. From the sharpness of the muzzle and the brownish-red colour they are commonly known as flying-foxes, a name unfortunately used also for an insectivore, Galeopithecus.

The insectivorous bats are illustrated by the vampire, fig. 9, and by the long-eared and common bat, figs. 10, 11, 12. The obvious difference in the figures, namely, the possession by the vampire of lanceolate or leaf-like cutaneous appendages to the nose, furnishes the external guide to the arrangement of the sub-order. The *Istiophora*, as that section is called to which the most blood-thirsty animals belong, include the genus *Desmodus* of South America (which certainly contains blood-sucking species, while that long known as *the* vampire appears not to be a blood-sucker), the leaf-nosed bats (*Phyllostoma*), the horse-shoe bat (*Rhinolophus*), the broad-winged bat (*Megaderma*), and the mormops, which, with its rudimentary nasal appendages, forms a transition to the gymnorhinous or naked-faced group. The teeth in this group range from twenty in *Desmodus* to thirty-two in *Rhinolophus* (fig. 13). The *Gymnorhina*, or bats without nasal cutaneous appendages, have the molar teeth sharply tuberculated, and the tragus of the ear is always enlarged so as to form a kind of valve, conspicuous in fig. 11. The common bats of the genera *Vespertilio* and *Scotophilus* have a very wide distribution, the former being cosmopolitan. In geological time the bats range from the Eocene tertiaries down to the present, the Istiophora and Vespertilio being among the earliest and most common forms. Lastly, it is noteworthy in connection with the mode of their distribution, that they are found on oceanic islands on which no other mammals exist, their power of flight giving them an obvious advantage

CHEKE, Sir John, an English statesman and famous Greek scholar, was born at Cambridge on June 16, 1514, and received his education at St. John's College, in the university. He gained great distinction in classics, especially in Greek, of which in 1540 he became the first regius professor in his university. While in this office he distinguished himself by introducing a new system (similar to that now prevailing in England) in the pronunciation of that language; but Bishop Gardiner, chancellor of the university, opposed his innovations, and a correspondence took place between them, which was published at Basel in 1555. In 1544 Cheke was appointed tutor to the Prince of Wales, afterwards Edward VI., and he also assisted in the education of the Princess Elizabeth. About this time he was appointed canon of King's College (now Christ Church), Oxford. On the accession of Edward in 1547 he received a pension of 100 marks, in 1548 was made provost of King's College, Cambridge, and obtained considerable grants of landed property. He remained a great favourite with the king to the end of his reign. He was member for Bletchingley in the parliaments of 1547 and 1552–53. In 1550 he was made gentleman of the king's bedchamber, in 1552 he was knighted, and in 1553 he obtained the post of secretary of state. The death of his royal patron occasioned a revolution in his fortunes. As a Protestant he engaged in the scheme for raising Lady Jane Grey to the crown, and on its failure was committed to the Tower in July, 1553. In September of the following year, however, he was set at liberty, and having obtained from Queen Mary permission to travel, he went into Italy and thence to Strasburg, where he was obliged to support himself by giving lectures on the Greek language. In 1556, having visited Brussels, he was arrested by order of Philip II., then sovereign of the Netherlands, and sent prisoner to England. The queen sent two of her chaplains to visit him in the Tower, with the purpose of converting him; but without avail. Dr. Feckenham, dean of St. Paul's, was more successful with his concise argument, 'Comply or burn'. The fear of death prevailed over his constancy, and he was induced to make a public abjuration of his former faith. It is a circumstance honourable to his character that he appears to have keenly felt his degraded situation. He died of grief not long after, on Sept. 13, 1557. Sir John Cheke published in English several treatises, original and translated, chiefly relating to theology, and translated various Greek and other works into Latin. Among his writings is an English translation of the Gospel of St. Matthew, exemplifying proposed reforms in English spelling.

CHEKIANG, a maritime province of China, lying north of Fu-kien and south of Kiang-su, and including the Chusan Archipelago; area, 39,150 square miles; pop. 11,588,692. It is traversed by several mountain ranges separated by narrow fertile valleys, but on the coast much of the country is flat. The climate is healthy, and the inhabitants skilful and industrious, producing in particular silk fabrics of unrivalled beauty. Coal is found in the north, and iron ore is mined in the south. Building stone is quarried near Ning-po, and salt is manufactured from sea-water on the coast. The capital is Hang-choo; Ning-po and Wen-chow are treaty ports.

CHELMSFORD, a municipal borough of England, capital of the county of Essex, 29 miles N.E. London, on the Great Eastern Railway, situated in a beautiful valley at the confluence of the Chelmer and Cann, the latter having previously received the Wid. It consists of one principal street, with many smaller ones, well paved, and houses mostly substantially built. There is a good municipal water-supply, and the streets are lighted by electricity. There are bridges over both the Chelmer and the Cann. The church of St. Mary is a fine old building of the fourteenth or fifteenth century, with a square embattled tower, surmounted by a tall spire. Several of the public buildings and institutions are handsome, amongst them being the corn-exchange and the shire-hall, containing the courts of assize and an elegant assembly-room. There are manufactories of agricultural implements, electric lighting and wireless telegraphy works; and a considerable trade in corn and malt is carried on. On the banks of the Chelmer are several large flour-mills. The town gives name to a parl. division of the county. The Romans had a station on the site of Chelmsford, and Roman remains have been found in the neighbourhood. Pop. in 1881, 9793; in 1891, 11,008; in 1901, 12,580.

CHELONE, in Grecian mythology, a nymph who, having failed to be present at the marriage of Zeus and Hera, and having ridiculed their nuptials, was plunged with her house by Hermes into the river on whose banks she dwelt, changed into a tortoise, and thus condemned for ever to carry her house upon her back.

CHELONIANS, an order of reptiles, including the tortoises and turtles, distinguished from all other vertebrate animals by having the body inclosed between a double shield or shell, from which the head, tail, and limbs are protruded. The body, in general short and compressed, differs much in its length and height, according as the species are more or less terrestrial or aquatic. The neck and tail vary in length, are generally retractile, and always movable. The shell, on the contrary, is generally immovable in all its parts, but in some species is movable either behind or before, and in other species is movable both ways, allowing the animal to shut itself completely in as in a box. The limbs are four in number. The feet are terminated by toes, which, in the land species, are short; in the marsh and river species, palmated, divided, and webbed; and in the ocean species, forming the turtles or Chelonidæ, extended into large and undivided paddles. The chelonians have no teeth, but are generally provided with horny jaws. The male is often recognizable externally by a concavity in the lower shell; the female lays eggs covered with a hard shell. Some live on fish, worms, molluscs, and other animals; others, forming the far larger number, are herbivorous. Their retention of life is very remarkable. There are a number of families included in the order. See Tortoise, Turtle, and Reptiles.

CHELSEA, a parish in Middlesex and western suburb of London, on the north side of the Thames, chiefly distinguished for containing a royal military hospital. A building was originally commenced here by James I. as a theological college, but was never finished. In the reign of Charles II. the erection of the present convenient hospital for the reception of sick, maimed, and superannuated soldiers was commenced on its site, the foundation stone being laid by the king on Feb. 17, 1682. The funds for the building were derived principally from the poundage then deducted from the pay of the forces, with the addition of a day's pay deducted from the pay of every officer and soldier each year. It was carried on during the reign of King James II., and finished in that of William and Mary by Sir Christopher Wren in 1692. The whole expense of this structure amounted to £150,000, and the extent of the grounds is now about 66 acres. The pensioners maintained here number about 550, and consist of soldiers maimed or disabled in the military service, or who have served for twenty-one years. They are provided with clothes, lodging, and diet, and have also a weekly allowance. All pensions are granted by the commissioners of Chelsea Hospital, but most of the recipients are known as out-pensioners. Their number amounts to about 80,000. It is from them that the in-pensioners are selected. Not far from the hospital is a royal military asylum for the education and maintenance of the children of soldiers. The parliamentary borough of Chelsea was created as a two-member constituency in 1867; the present borough consists of Chelsea parish only, and has one member. Pop. (1901), 93,841. See LONDON.

CHELTENHAM, a municipal and parliamentary borough, and fashionable watering-place in England, in the county of Gloucester, and 7 miles N.E. of the city of Gloucester, on the river Chelt, a short tributary of the Severn. There are two principal railway stations—one belonging to the Midland Railway system, the other to that of the Great Western,—the distance from London by rail being 120 miles. The situation of the town is one of great beauty, in the extensive valley of Gloucester, sheltered by the Cotswold Hills, giving to the place the advantage of the sight of fertile hills, visible from almost every street. It is in truth a city of gardens, protected by hills, with many lovely drives and rides, both in the valley and on the hills. Cheltenham spas first of all occasioned the rapid growth of the town; latterly, though the Spa gardens of Pittville and Montpellier are frequented as places of fashionable amusement, few people visit the town for bathing or drinking the springs. The waters of the spas consist of saline, sulphuric, and chalybeate waters, and are highly commended for bilious and dyspeptic cases. These springs were discovered in 1716 by accident, but became famous in 1788 through a visit paid to them by George III. Cheltenham is admirably supplied with churches and chapels of various denominations. The parish church is a fine old Gothic cruciform structure with a tower containing a peal of eight bells, and a lofty spire; and the Roman Catholic and Congregational churches are two of the finest in England. The town has of late become especially distinguished as an educational centre. The proprietary college for boys (founded in 1843) is one of great repute, with an attendance of 700 scholars; and the ladies' college, with 500 pupils, ranks with the highest in the history of female education. There are also two training colleges for teachers, and many excellent private schools. Among the other public institutions may be mentioned its libraries, assembly-rooms, the college museum, pump-rooms, theatre, and numerous places of fashionable resort. The charities of Cheltenham are numerous and well supported, and consist among others of the hospital and dispensary, alms-houses, boys' and girls' orphan asylums, an eye dispensary, a lying-in hospital, a homœopathic dispensary, &c. Cheltenham returns one member to Parliament. Except a large brewery and iron-work, employing 200 men, the town has little trade, but depends almost wholly on the numerous visitors who resort to it, and its resident families, many of whom come and settle in it because of its healthfulness, its educational advantages, and its various other attractions. Pop., parl. bor., in 1901, 52,858; mun. bor., 49,439.

CHEMICAL RAYS. A not very appropriate name given to the rays of higher refrangibility in the spectrum (see SPECTRUM). The blue and violet rays of the spectrum, and also the non-luminous rays at the violet end of the spectrum, have a peculiarly powerful chemical effect on silver compounds, on photographic paper, for instance, which is prepared by moistening soft paper with solution of common salt, and then steeping it in solution of nitrate of silver. The blue, violet, and non-luminous rays at that end of the spectrum quickly blacken such paper when it is exposed to their influence. The remainder of the spectrum has not this power; paper sensitised with silver salts is not attacked at all by yellow light for example. Hence the name *chemical rays* is given to those above mentioned. The term is, however, misleading, for there are other chemical compounds that are acted on by other parts of the spectrum; and the truth seems to be that for each particular sensitive compound there is one particular part, or sometimes two or three particular parts of the spectrum with maximum chemical influence for the decomposition of it.

CHEMISTRY, a word derived from *chemist*, which is a shortened form of *alchemist*, being originally used to designate the art of making gold artificially, that is alchemy. It is now applied to the science which treats of the nature, laws of combination, and mutual actions of the minute particles of the different sorts of matter composing our globe, and the properties of the compounds they form.

The historians of chemistry have claimed for it a very high antiquity, and have attributed its origin to the Egyptians, who undoubtedly displayed great skill in some of the chemical arts; but there is no evidence to show that they either studied or understood the scientific principles of the arts they practised. It is probable that the Arabian physicians deserve the merit of having grouped together and classified the chemical facts then known, and in the search for substances adapted to medicinal use they added materially to their number. Such positive additions to our knowledge belong, however, chiefly to the earlier members of the Arabian school, of which Geber, who flourished during the eighth century, is considered the most distinguished ornament; for in course of time their efforts were directed entirely to the transmutation of the metals, for which every other branch of inquiry was abandoned. It is at this period that the present name of the science makes its appearance in the form of the word alchemy, and the prefix of the Arabic article *al* sufficiently indicates the source through which it reached Europe. The transmutation of the base metals into gold, to which the alchemists devoted their entire attention, has long been a favourite theme for the ridicule and contempt of modern authors, which was to a great extent justified by the absurd pretensions and charlatanry of most of their number. It is worthy of observation, however, that their ideas, though now known to be unfounded, were by no means an illogical inference from the facts then known. The fundamental idea of alchemy, divested of the absurd superstructure which it was afterwards made to bear, appears to be based upon the familiar fact that when the metallic ores are smelted, it is necessary to employ certain fluxes, such as lime and quartz, which were then believed to operate by removing their impurities or imperfections, and enabling the metal, which was considered to be a more perfect form of the ore, to display its characteristic properties. As it was found that the metals, by appropriate processes, might be refined and obtained with increased lustre and beauty, it was inferred that by carrying out these processes to their limit the more subtle impurities of the base metals might be removed and the perfect gold obtained, and for this purpose it was supposed that a more potent flux, which received the name of the philosopher's stone, was required. In the search for this substance alchemy prescribed for itself, in the first instance, a well-defined subject for close experimental inquiry; but before long it became overloaded with extravagant speculations, and eventually so interwoven with the absurdities of judicial astrology, that it is frequently impossible to ascertain what may be considered as properly belonging to each, or even to understand the obscure and mystical language in which their doctrines are expressed.

In seeking for the philosopher's stone, most minerals, especially such as presented the characters of metallic ores, were subjected to numerous experiments, and many important isolated discoveries were made by Basil Valentine, Raymond Lully, Paracelsus, Van Helmont, and others, among which may be mentioned the strong mineral acids, antimony and its compounds, as well as many important salts of iron, mercury, and the alkalies. But during the latter part of the seventeenth century the belief in alchemy was greatly on the wane, and just at its close Becher threw out certain speculations regarding the cause of combustion, which were afterwards taken up and extended by Stahl, and constitute the first generalization of the phenomena of chemistry. Stahl assumed the existence of a principle which he called phlogiston, and supposed to exist in greater or less quantity in all inflammable substances, and to be separated from them in the act of combustion. This principle was further believed to play an important part in all chemical changes produced by the action of heat. Thus, when an ore was smelted it was supposed to absorb the phlogiston evolved during the combustion of the fuel in the furnace, and so was converted into the metal, while the metal itself, when exposed to heat, was again 'dephlogisticated' and converted into a 'calx', of which a familiar example is offered by the scum which forms on the surface of melted lead. The phlogistic theory, as it was commonly called, was universally adopted during the greater part of the eighteenth century, and although erroneous, it served to direct attention to the relations of phenomena which were previously considered to be entirely unconnected.

About the middle of the eighteenth century Dr. Black, while examining the action of heat upon magnesia, made his great discovery of a gas different from atmospheric air, which may be said to have proved the key to the true principles of chemistry. It was rapidly followed by the discovery of a number of other gases by Cavendish, Rutherford, Priestley, Scheele, &c.; and the discovery of oxygen by the two last-named chemists afforded to Lavoisier the means of establishing his system of chemistry, which at the close of the eighteenth century produced a complete revolution in the science. By an elaborate series of experiments he showed that all substances, when burned, absorb oxygen, and that the weight of the products of combustion is exactly equal to that of the combustible consumed and of the oxygen which has disappeared. The application of this theory to the great majority of the most important chemical phenomena was so obvious, and the demonstration supplied by Lavoisier so conclusive, that it was very rapidly adopted, and from that time the history of chemistry presents an unbroken series of remarkable discoveries.

But the most important step which the science has yet made is undoubtedly the discovery by Dalton of the laws of chemical combination. During the eighteenth century some important observations had been made by Richter and Wenzel regarding the proportions in which chemical substances combine; but their researches attracted very little attention, and were entirely unknown in Great Britain. In the year 1802 Dalton appears to have commenced his inquiries and established the simple laws according to which all combinations take place; and by means of his atomic theory he gave an explanation of their cause. Dalton's theory was immediately taken up by Berzelius; and to his influence, and the elaborate and careful experiments by means of which he determined the chemical equivalents of almost all the elements then known, its rapid adoption, particularly on the Continent, was mainly due. Of late years every branch of the science has been developed with great rapidity, but the most extraordinary progress has been made in organic chemistry, which sixty years since consisted only of a few isolated facts, but now exceeds in extent the inorganic department of the science. The remarkable researches of Chevreul on the oils and fats may be considered as the starting-point of this branch of chemistry, which, in the hands of Liebig, Dumas, Laurent, Gerhardt, and many others, has led to results of the very highest importance.

The investigations of chemists have shown that when the different substances found at the surface of the earth are submitted to various methods of treatment, the great majority of them can be broken up into several substances of less complicated nature. Thus, a piece of flint can be split up into two substances entirely different from it in appearance and properties; chalk yields three, alum four, and bone not less than nine different substances; while sulphur, iron, copper, gold, and certain other bodies resist all the processes to which they have as yet been subjected, and appear to consist of only one kind of matter. By submitting all the mineral, animal, and vegetable substances which come under our notice to appropriate processes, chemists have extracted from them about seventy substances, by the union of which all the different sorts of matter with which we are acquainted are built up. These substances are called the *chemical elements.*

When two or more of these substances are brought in contact, with the proper precautions, they unite and form a chemical compound, in which the constituents are held in union by a peculiar attractive force, which has received the name of *chemical attraction* or *affinity*. All matter is believed to be composed of minute particles or atoms, of which its mass is composed, but these need not be united by chemical attraction. If two minute particles of iron be brought into close contact, they adhere to one another by virtue of the attraction of cohesion, and produce a mass of larger size, but possessing properties in all respects identical with those of the particles of which it is composed. In the same way individual particles of sulphur may be made to cohere and form a larger mass of that substance. But if iron be heated in contact with sulphur, the result is different, for the mass so obtained is entirely distinct in its properties from either iron or sulphur—is perfectly homogeneous, and shows no traces of either of its constituents. The latter is an illustration of chemical attraction or affinity, which is characterized by its occurring between dissimilar particles, and producing a new kind of matter readily distinguishable from either of the substances combining to form it, and which cannot be again separated into its elements by merely mechanical processes. It is to be observed, however, that all these characters must be taken into account for the purpose of distinguishing chemical affinity, because cohesion does take place between dissimilar particles, as when copper is plated with silver by means of powerful pressure; but here the mass is not homogeneous, and each of its constituent metals can be at once distinguished. In a similar manner, pounded charcoal and sugar may be mixed together so uniformly that the mass, even under the microscope, appears perfectly homogeneous; but the absence of any chemical affinity is at once shown by throwing the mixture into water, which dissolves the sugar and allows the charcoal to deposit. Moreover, in this case there is no true alteration of properties, for the mixture retains the taste of the sugar, and its colour is intermediate between that of the two ingredients. But where chemical union takes place the result is entirely different, the compound retains none of the characters of the elements it contains. Thus when lead combines with oxygen, which is a colourless gas, we obtain a yellow powder, which is quite stable when heated, and has none of the properties of either the metal or the gas which combined.

Laws of Combination.—The laws according to which chemical substances combine are exceedingly simple. The first and most important states the fact that a compound is perfectly homogeneous, and that its composition is fixed and invariable. Experiment shows that if we take a quantity of hydrogen, for example, and cause it to combine with chlorine, it is necessary to supply it with 35·5 times its weight of that element, and by no process can these elements be caused to unite in any other proportions, so that when we take a substance which, by its external properties, can be recognized as a compound of these elements, no matter where or how it has been obtained, we are certain that its constituents must be present in it in these and no other proportions. If now we cause bromine to combine with hydrogen, experiment shows that we must take 80 parts of the former for one of the latter, and we thus obtain 81 parts of the compound; while, if iodine be used, 127 parts of it are required to replace 35·5 of chlorine, or 80 of bromine. If, again, we take potassium and bring it in contact with the ready-formed compound of hydrogen and chlorine, it at once expels the hydrogen, and forms a compound of chlorine and potassium in such proportions that 39·13 parts of potassium replace the 1 part of hydrogen. By similar experiments it is ascertained that 23 parts of sodium and 107·94 of silver can occupy the place of the 39·13 of potassium. While, therefore, 39·13 of potassium is capable of satisfying the affinity contained in 35·5 of chlorine, it requires 23 of sodium or 107·94 of silver to perform the same function, and these quantities of the different elements are said to be *equivalent* to one another. By proceeding further in this way, it is possible to obtain for each of the elements a number expressing the quantity of it which is capable of satisfying the affinity contained in one part of hydrogen. As, however, the number of compounds of hydrogen which were known and accurately examined at the time Dalton was engaged in the study of these laws was small, he preferred to make oxygen his standard of comparison, and having found that 8 parts of that element combined with 1 part of hydrogen, he chose as the combining proportion of every element that quantity of it which was capable of entering into union with 8 parts of oxygen. When this was done, however, certain anomalies presented themselves, for while 8 parts of oxygen satisfied the affinities of 14 parts of nitrogen, experiment showed that 3 parts of hydrogen entered into union with 14 of nitrogen, or, in other words, that that quantity was equivalent not to 1 but to 3 combining proportions of hydrogen. It therefore became necessary to abandon the use of the word equivalent in the strict sense in which it was at first used, and to employ the words 'combining proportion' to express the numbers determined in the manner just described. Proceeding still further, experiment showed that nitrogen was capable of forming several different compounds with oxygen, in which 14 parts of the former element combined not only with 8 of the latter, but also with 16, 24, 32, and 40 parts, though with no intermediate quantities. Similar relations were also found to exist between the compounds of other elements. Thus, 200 parts of mercury can combine either with 35·5 or with 71 parts of chlorine, and 39·13 parts of potassium may be made to unite, according to the mode in which the experiment is made, either with 16, 32, 48, or 80 of sulphur. So far we deal entirely with facts; but Dalton was led to seek for an explanation of these, and for this purpose he devised a hypothesis which was put forth simultaneously with the facts, and afforded at once so reasonable and clear an explanation of them, that it unquestionably did much to fix the attention of scientific men upon his views, and to promote their speedy adoption.

From a very early period in the history of science it has been assumed that matter is composed of minute particles or atoms; but this idea was adopted for the purpose of offering an explanation of its physical properties, and its strictly chemical properties were entirely disregarded, nor was any attempt made to explain them until Dalton enunciated his views, which assumed that if we take, for example, the compound of hydrogen and chlorine, and subdivide it, we should at last obtain the ultimate particle of that substance, which could then be no further divided by mechanical means, but might by chemical processes be resolved into an atom of hydrogen and an atom of chlorine; but as these substances are contained in the compound in the proportion of 1 part by weight of hydrogen to 35·5 of chlorine, it follows that these numbers must represent the relative weights of the ultimate atoms of the elements in question. In short, the numbers expressing the proportions in which the elements combine represent also the relative weights of the atoms of which the different kinds of matter are composed. This hypothesis further explains the reason why, when different compounds of nitrogen and oxygen are formed, the oxygen must either be 8, 16, 24, 32, or 40; any other quantity, in fact, would represent a fraction of the atom, which, by the hypothesis itself, is assumed to be indivisible.

Dalton's hypothesis having soon been universally adopted, led to a very extensive series of investigations, for the purpose of fixing with precision the exact numbers which represent the relative weights of the atoms of the different elements; and through such investigations the combining proportions of the most important elements have been now ascertained with remarkable accuracy.

Combination by Volume.—Shortly after the announcement of Dalton's views, Gay Lussac published a highly-important memoir, in which he showed that the combination of gases might be considered from another point of view, and that a very simple relation exists between the volumes in which they unite. Thus it is found that if we wish to cause hydrogen and chlorine to combine, they must be presented to one another in equal volumes. A cubic foot of chlorine, for example, will combine with neither more nor less than a cubic foot of hydrogen, and the compound formed will occupy 2 cubic feet, or precisely the same space as its constituents did before combination. The number of elements which are capable of existing in the gaseous form at ordinary temperatures is, however, extremely small; but it was pointed out that if volatile elements be converted into vapour by the aid of heat, they obey the same law. Thus bromine and iodine are readily volatilized, and the vapours, that is to say, the gases they yield, will each combine with its own volume of hydrogen; and the compounds formed, which are gaseous at ordinary temperatures in each case, occupy just twice the volume of the hydrogen they contain. With oxygen, however, the case is different. One volume of that substance combines with 2 of hydrogen, and the compound formed, when in the gaseous form, no longer occupies the same space as its constituent gases, but the 2 volumes of hydrogen and 1 of oxygen are condensed into 2 volumes of gaseous water, which is commonly known by the name of *steam*. A third illustration is offered by nitrogen and hydrogen, but here 1 volume of nitrogen combines with 3 volumes of hydrogen, and the resulting gas fills just half the space which its constituents occupied when uncombined.

On such facts as these Gay Lussac based his law of combining volumes, which states that, when two or more gaseous substances react with one another their volumes are simply related, and if a gas is formed in the reaction its volume is also simply related to the volumes of the reacting gases. For instance, when carbon monoxide combines with oxygen, the volumes of these gases are as two to one, and the volume of the carbon dioxide formed is twice that of the monoxide and equal to that of the oxygen taking part in the reaction.

In 1811, three years after Gay Lussac published his memoir, Avogadro formulated the theory that equal volumes of gases (under similar conditions of temperature and pressure) contain the same number of molecules. He arrived at this conclusion from the consideration of Gay Lussac's law and Dalton's laws of combination. This theory, which has been more recently developed from the kinetic theory of gases, is now generally known as Avogadro's law. Although now recognized as a fundamental law of modern chemistry, it remained practically ignored for about forty years, from the time of its formulation until it was revived and developed by Laurent and Gerhardt, who pointed out its great importance as a basis for the determination of molecular weights. If the validity of Avogadro's law be admitted, it follows that the relative weights of equal volumes of gases must be proportionally related to the weights of the contained molecules. It is evident, then, that if it be possible to ascertain the molecular weight of a gaseous substance, the molecular weight of any other gas may be determined by comparing the weight of a certain volume of the latter with the weight of an equal volume of the substance of known molecular weight.

The relative densities of other gases are compared with the density of hydrogen taken = 1. The relative molecular weights of other gases are also compared with the molecular weight of hydrogen taken as the standard. It would appear that the molecules of most elementary gases consist not of one but of two atoms. This may be proved as follows:—We know from experiment that one volume of hydrogen combines with one volume of chlorine to form two volumes of hydrochloric acid gas. Now, from Avogadro's law it follows that this volume of hydrochloric acid contains twice as many molecules as the volume of hydrogen or of chlorine; and, as each molecule of hydrochloric acid contains at least one atom of hydrogen, it is obvious that each molecule of hydrogen must contain at least two atoms. Similarly each molecule of chlorine must consist of at least two atoms. For this and other reasons the molecule of hydrogen is represented as having this constitution. The molecular weight of hydrogen is therefore taken = 2, each atom being = 1. Hence the molecular weight of any substance may be defined as the weight of that quantity of it which, in the state of vapour, occupies the same volume as two parts by weight of hydrogen. In order to determine the molecular weight of a substance in the state of vapour, it is only necessary to ascertain its relative density compared with hydrogen (= 1), and to multiply this by two.

Laurent and Gerhardt were the first to clearly distinguish between the terms *molecule*, *atom*, and *equivalent*. Their definition of a molecule is embodied in that of molecular weight, given above. An atom may be defined as the smallest quantity of an element existing in all molecules in which that element is present. An equivalent is that quantity of an element which is capable of combining with or displacing one part by weight of hydrogen.

Atomic Weights.—After the enunciation of his atomic theory, Dalton naturally proposed to ascribe certain values to the different elements as their atomic weights. Berzelius also devised a system of atomic weights which was largely adopted. Considerable confusion, however, existed as to the true chemical values of the atoms, many chemists using different values from others. It was not, indeed, until 1858 that this unsatisfactory state of matters was cleared up. In this year, the Italian chemist Cannizzaro published a memoir on the subject. To him is due the honour of clearly establishing the foundations on which the determinations of the correct atomic weights should rest. He pointed out the value of vapour-density determinations, and, in th ecase of solids, of specific-heat determinations, for this purpose.

By means of the first method it is possible to ascertain the molecular weights of many volatile compounds containing a certain element, and by analysis the quantity of that element present in such a quantity may be determined. Bearing in mind that the atomic weight of an element is the smallest quantity of it entering into the composition of the molecules in which it is present, it will be obvious that we have in this method a very definite means of determining atomic weight. The following table, showing the values referred to in the case of certain oxygen compounds, will make this clear:

	Vapour Density (H=1)	Molecular Weight.	Weight of Oxygen.
Water	9	18	16
Carbon dioxide...	22	44	32
Sulphur dioxide..	32	64	32
Carbon monoxide	14	28	16
Nitrous oxide....	22	44	16
Ethyl alcohol	23	46	16

It will be noticed that the smallest quantity of oxygen present in the molecules of these substances is 16 parts by weight. Provided a sufficient number of volatile compounds have been investigated in this way, it may safely be assumed that this number is the true atomic weight of oxygen.

The second method referred to above is based on the law of Dulong and Petit. According to this law the atoms of the elements in the solid state have the same capacity for heat. This constant, which is called the atomic heat, is found to be 6·4; the atomic weight of an element is therefore found by dividing this value by the specific heat of the solid element. There exist certain notable exceptions to this law.

Although hydrogen (= 1) is nominally taken as the standard of atomic weights, it is at present more customary, for certain reasons, to take the atomic weight of oxygen (= 16·00) as the standard; in this case the atomic weight of hydrogen becomes 1·01.

The following table contains a list of the atomic weights of the elements deduced from the most accurate experiments, to which is added a column of *symbols*, the use of which will be afterwards explained:—

Aluminium	Al	27·10
Antimony	Sb	120·00
Argon (?)	A	40·00
Arsenic	As	75·00
Barium	Ba	137·40
Beryllium	Be	9·10
Bismuth	Bi	208·50
Boron	B	11·00
Bromine	Br	79·96
Cadmium	Cd	112·00
Caesium	Cs	133·00
Calcium	Ca	40·00
Carbon	C	12·00
Cerium	Ce	140·00
Chlorine	Cl	35·45
Chromium	Cr	52·10
Cobalt	Co	59·00
Copper	Cu	63·60
Erbium (?)	Er	166·00
Fluorine	F	19·00
Gallium	Ga	70·00
Germanium	Ge	72·00
Gold	Au	197·20
Helium (?)	He	4·00
Hydrogen	H	1·01
Indium	In	114·00
Iodine	I	126·85
Iridium	Ir	193·00
Iron	Fe	56·00
Lanthanium	La	138·00
Lead	Pb	206·90
Lithium	Li	7·03
Magnesium	Mg	24·36
Manganese	Mn	55·00
Mercury	Hg	200·30
Molybdenum	Mo	96·00
Neodidymium (?)	Nd	144·00
Nickel	Ni	58·70
Niobium	Nb	94·00
Nitrogen	N	14·04
Osmium	Os	191·00
Oxygen	O	16·00
Palladium	Pd	106·00
Phosphorus	P	31·00
Platinum	Pt	194·80
Potassium	K	39·15
Praseodidymium(?)	Pr	140·00
Rhodium	Rh	103·00
Rubidium	Rb	85·40
Ruthenium	Ru	101·70
Samarium (?)	Sm	150·00
Scandium	Sc	44·10
Selenium	Se	79·10
Silicon	Si	28·40
Silver	Ag	107·93
Sodium	Na	23·05
Strontium	Sr	87·60
Sulphur	S	32·06
Tantalum	Ta	183·00
Tellurium	Te	127·00
Thallium	Tl	204·10
Thorium	Th	232·00
Tin	Sn	118·50
Titanium	Ti	48·10
Tungsten	W	184·00
Uranium	U	239·50
Vanadium	V	51·20
Ytterbium	Yb	173·00
Yttrium	Y	89·00
Zinc	Zn	65·40
Zirconium	Zr	90·60

In connection with the atomic weights, it should be mentioned that one of the most important generalizations of modern chemistry is contained in the Periodic Law. This states that the properties of the elements and of their compounds are a periodic function of the atomic weights. The relation between the properties of the elements and their atomic weights was first noticed by Newlands in 1864, but it was independently discovered five years later by Mendeléeff, who developed this idea most thoroughly. If the elements are arranged in the order of their atomic weights, it will be noticed that their properties reappear periodically with every eighth element. Mendeléeff tabulated the elements according to this idea, so that in his classification each element places itself naturally among those having similar properties, as is shown in the following table:—

	Group I.		Group II.		Group III.		Group IV.		Group V.		Group VI.		Group VII.		Group VIII.
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
		H		—		—		—		—		—		—	
1st Short Period	Li		Be			B		C		N		O		F	
2nd Short Period	Na		Mg			Al		Si		P		S		Cl	
1st Long Period	K		Ca		Sc		Ti		V		Cr		Mn		Fe, Co, Ni.
		Cu		Zn		Ga		Ge		As		Se		Br	
2nd Long Period	Rb		Sr		Y		Zr		Nb		Mo		—		Ru, Rh, Pd.
		Ag		Cd		In		Sn		Sb		Te		I	
3rd Long Period	Cs		Ba		La		Ce		—		—		—		— — —
		—		—		—		—		—		—		—	
4th Long Period	—		—		Yb		—		—		W		—		Os, Ir, Pt.
		Au		Hg		Tl		Pb		Bi		—		—	
5th Long Period	—		—		Th		—		—		U		—		— — —
		—		—		—		—		—		—		—	

There is no doubt that some connection exists between the properties of the elements and their atomic weights, but whether Mendeléeff's classification is the most perfect that can be devised remains to be seen. It certainly contains a few anomalies which are difficult to explain. In any case it has conferred a great benefit on modern chemistry, and has been most useful, not only in systematizing the study of the subject and in affording a means of deciding certain doubtful atomic weights, but by its means Mendeléeff actually predicted the existence and properties of a few elements, predictions which have since been fulfilled, and have thus strengthened the belief in the Periodic Law, and given an impulse to research in various directions.

Chemical Nomenclature.—The names employed by the old chemists were generally derived from some property of the substance, or indicated the mode in which it was prepared, and sometimes the substance from which it was obtained. Of these, oil of vitriol, corrosive sublimate, spirit of salt, and liver of sulphur may serve as examples. Such names, always inconvenient, became quite unusable when Lavoisier's system was introduced, and very shortly afterwards the French Academy of Sciences appointed a committee to devise an improved system. The system then introduced, of which the chief merit is due to Guyton Morveau, was at the time absolutely perfect, and though somewhat modified to suit the requirements of the modern science, still remains substantially what it was. The principle on which it is founded is that the name of every compound should express its elements, and as far as possible the proportions in which they are present in it. Accordingly names are applied to all the elements, derived generally from some conspicuous property they possess. Thus chlorine is so called from Greek *chlōros*, yellow, owing to its yellow colour; hydrogen from *hydor*, water, and root *gen*, to generate, because by uniting with oxygen it forms water; and so on with all the others. An attempt has been made to make the name express also the class to which the substance belongs, although this has not been very completely carried out. Thus all the metals (except, of course, those which have been long known, and of which the common names cannot be altered) are made to terminate in *-um*, as potassium, barium, &c.; and the substances allied to chlorine have a similar termination to it. The nomenclature of compounds was based on the existence of two classes of substances opposed to one another in their properties, and known as acids and bases, for the designation of which different principles were employed. All the bases known at the close of the eighteenth century were oxygen compounds, and they were known by the general name of oxides. Thus, oxide of iron and oxide of copper are compounds of these metals with oxygen, possessed of more or less well-marked basic properties. The compounds of chlorine, iodine, and bromine were called chlorides, iodides, and bromides. Those of sulphur, carbon, boron, and silicon were originally designated sulphurets, carburets, borurets, &c., though the terms sulphides, borides, carbides are now more commonly employed. When an element forms more than one compound with another element a more definite nomenclature must be adopted.

Thus, for example, in the case of oxides, when the molecule of an oxide contains only one atom of oxygen it is termed a monoxide; with two atoms it is called a dioxide; with three, a trioxide. Sometimes the name peroxide is given to indicate special properties; while an oxide containing two atoms of an element with three atoms of oxygen is sometimes termed a sesquioxide. When a metal forms two basic oxides, that containing the less amount of oxygen is given the termination *-ous*, the other having the termination *-ic*. Thus we have cuprous and cupric, ferrous and ferric, oxides. The compounds derived from these oxides are distinguished in a similar manner. When the compound formed possesses acid instead of basic properties, the system employed is different, and has its origin in the belief entertained by chemists in the eighteenth century that all acids were oxygen compounds, and that it was therefore unnecessary to indicate the existence of oxygen in them, as the word acid sufficiently did so. Thus, sulphur forms two different acid compounds called respectively sulphurous and sulphuric acids, the termination in *-ous* being allotted to the compound containing the smaller, that in *-ic* to the one containing the larger proportion of oxygen. In a similar manner we have phosphorous and phosphoric, chlorous and chloric, acids. The contrivers of the present nomenclature did not provide for more than two acid compounds of any one element, that being the largest number then known. But since that time it has been found that there may be four or five such compounds, and in place of using new terminations for such acids, chemists have chosen to employ a prefix. In the case of chlorine and oxygen, after the name chloric acid had been made use of, another acid containing a larger quantity of oxygen was discovered, for which the name of hyperchloric acid, usually shortened into perchloric acid, was devised.

With the progress of the science, however, the idea attached to the word acid has been materially altered and extended. It was at first applied to all substances which possessed a sour taste, and such bodies being, according to the knowledge of the time, all compounds containing a large quantity of oxygen, it was believed that they owed their acid properties to it. Further observation, however, showed that there were many powerful acids which contained no oxygen, but that hydrogen was invariably present. The names, however, had then become so fixed that it was impossible to alter them, and it became necessary to distinguish those which contained hydrogen only by a special prefix. Thus hydrochloric acid is a compound of hydrogen and chlorine; chloric acid, a compound of hydrogen, chlorine, and oxygen; hydrosulphuric acid, a compound of hydrogen and sulphur; sulphuric acid, a compound of hydrogen, sulphur, and oxygen.

The names of acids were formed in order to enable chemists to have simple designations for *salts*, a class of bodies produced when the metal takes the place of the hydrogen of an acid. Thus, if zinc be brought in contact with sulphuric acid, the hydrogen of the acid is immediately expelled, the zinc takes its place, and a salt called zinc sulphate is produced, the termination in *-ate* expressing the fact that the salt is derived from an acid whose name terminates in *-ic*, and the salts of acids whose names end in *-ous* have their termination in *-ite*. Thus, potassium sulphite is derived from sulphurous acid, and in a similar manner we obtain sodium hyposulphite and potassium perchlorate as names of the salts formed from these metals and hyposulphurous and perchloric acids respectively.

Chemical Symbols.—Very soon after the publication of Dalton's views Berzelius introduced a system of symbols by which the composition of the more complex chemical compounds can be represented with much greater precision than any nomenclature admits of; and the plan proposed by him, though with some modifications rendered necessary by the progress of the science, is now univerally accepted, and has indeed become quite indispensable to the chemist. Every element is represented by a symbol, which is the initial letter of its Latin name. Thus, C represents carbon, S sulphur, and K potassium, of which the Latin name is *kalium*. Where several elements have the same initial a small letter is attached to it for the sake of distinction, the single letter being reserved for the most important element whose name it commences. Thus, as already mentioned, C is the symbol of carbon, Ca that of calcium, Ce cerium, Co cobalt, and Cu copper (*cuprum*). These symbols are further understood in all cases to represent not any indefinite quantity, but always an atom of each element. The symbols of compounds are formed by the juxtaposition of those of their elements. Thus—

HCl	Hydrochloric acid,
PbO	Lead oxide,
BaS	Barium sulphide,

express the fact that these compounds contain single atoms of their constituents; that hydrochloric acid, for example, is a compound of 1 part of hydrogen and 35·5 of chlorine; and barium sulphide of 137 parts of that metal and 32 of sulphur. When more than one atom of an element exists in any compound this is indicated by a coefficient placed after its symbol. Thus H_2O is a compound of two atoms of hydrogen and one of oxygen; SO_3, a compound of one atom of sulphur and three of oxygen; Fe_2Cl_6, a compound of two atoms of iron and six of chlorine. So likewise we have—

Barium chloride	$Ba\,Cl_2$
Ferrous chloride	$Fe\,Cl_2$
Ferric chloride	Fe_2Cl_6
Stannous chloride	$Sn\,Cl_2$
Stannic chloride	$Sn\,Cl_4$

So that the symbol expresses more distinctly than the name the composition of the compound, and gives in every case the proportion in which the elements exist in it. Where it is necessary to express more than one atom or molecule of the compound this is done by prefixing to the symbol a large number written on the line. Thus, $2\,Ba\,Cl_2$ means two molecules of barium chloride; and $3\,Fe_2O_3$, three molecules of ferric oxide. The advantages offered by these symbols become still more apparent in the case of very complex compounds. Thus, the crystallized magnesium sulphate is $Mg\,SO_4,\ 7\,H_2O$, and morphine is $C_{17}H_{19}NO_3$. By a systematic arrangement of the symbols in each compound an attempt is made to indicate to a certain extent their chemical functions. Thus, in an acid, the hydrogen, which may be replaced by a metal, begins the formula of the compound; sulphuric acid, for instance, is written H_2SO_4, and potassium sulphate K_2SO_4, the potassium here occupying the same position as the hydrogen it has displaced.

The symbols are also very advantageously used to express the changes which occur during chemical action, and they are then written in the form of an equation, of which one side represents the condition in which the substances exist before the change, the other the result of the reaction. The following equations will serve to illustrate the manner in which the symbols are thus employed:—

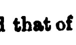
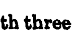
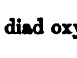
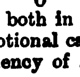
$$H_2 + Cl_2 = 2\,HCl$$
Hydrogen. Chlorine. Hydrochloric acid.

$$Fe + 2\,HCl = FeCl_2 + H_2$$
Iron. Hydrochloric acid. Ferrous chloride. Hydrogen.

$$HgCl_2 + 2\,KI = HgI_2 + 2\,KCl$$
Mercuric chloride. Potassium iodide. Mercuric iodide. Potassium chloride.

$$K_2SO_4 + Ba(NO_3)_2 = BaSO_4 + 2\,KNO_3$$
Potassium sulphate. Barium nitrate. Barium sulphate. Potassium nitrate.

In these equations the + sign is used in the sense of mixture with, and it should not be employed for the purpose of connecting together the symbols of one compound; but in this respect many chemists permit considerable latitude, and it is not unfrequently used to characterize a low degree of affinity, such as that which exists between a salt and what is called its water of crystallization, but its use in this way is better avoided; and a comma is sometimes introduced into the symbol in the proper position, thus, Na_2SO_4, $10\,H_2O$, or the symbols may be written in simple juxtaposition, water of crystallization being always put at the extreme right.

Valency.—It has been already remarked that chemists have agreed to accept as the atom of every element the smallest quantity of it which is capable of existing in two gaseous volumes of any compound, and this has led to the recognition of a peculiarity in the combining power of the different elements. Thus, when an atom of chlorine, weighing 35·5, is brought in contact with hydrogen it is found to combine with one atom of that substance, and by no process can it be made to unite with a larger or a smaller quantity. When an atom of oxygen, weighing 16, comes in contact with hydrogen, however, it combines with two parts, or two atoms, of that element. An atom of nitrogen, weighing 14, combines with three parts or three atoms of hydrogen, and by no process can it be made to combine with one atom. These elements are therefore said to possess different valencies; hydrogen is called a monovalent element, oxygen divalent, and nitrogen trivalent. With reference to this fact, therefore, the elements have been divided into several classes according to the number of atoms of hydrogen to which they are equivalent, or with which they can combine, and they are described as monads, diads, triads, &c. No physical explanation of the cause of this peculiarity of the different elements has yet been obtained, and chemists have been compelled to have recourse to hypotheses, in regard to which perfect unanimity can scarcely be said to prevail. The idea which is made use of is that the atoms of the elements have certain points of attachment with one another, varying in number in each case. A monad is supposed to have one point of attachment, a diad two, and so on, and these have been called *bonds*. A diad, therefore, having two bonds or points of attachment, is capable of assimilating, as it were, two monads, a triad three monads. This may be represented diagrammatically by using lines surrounding the ordinary symbol of the element. Thus triad nitrogen is  , and hexad sulphur  . The compound of nitrogen and hydrogen, therefore, is  , and that of hexad sulphur with three atoms of diad oxygen is  . Such symbols, being very inconvenient both in writing and printing, are only used in exceptional cases; but it is customary to express the valency of an element or compound by dashes attached to its ordinary symbol. Thus, monad hydrogen is H′, diad oxygen O″, triad nitrogen N‴, and when the valency exceeds three a small Roman numeral is employed; thus, tetratomic carbon is C^{iv}. Experience has further shown that the valency of an element is capable of varying. Thus, phosphorus is sometimes triatomic, at others pentatomic. It is important to observe that the doctrine of valency is of a very hypothetical character, and it is most desirable that undue importance should not be attached to it, for it cannot be considered as more than a temporary hypothesis which has done good service as a guide to the chemical investigator.

Classification of Chemical Compounds.—When the properties of chemical compounds are studied it is immediately apparent that they may be classified not merely under the head of the particular elements they contain, but also according to their special chemical functions. The latter method indeed presents some advantages which were recognized at a very early period of chemical history, and the distinction between acids and alkalies dates back to a period long antecedent to that at which their true nature was ascertained.

Acids.—The term acid, originally restricted to substances which possess a sour taste, was long extended to all compounds having the property of reddening blue litmus and other vegetable blues. As the science advanced, however, it was found that a great many substances existed which possessed chemical functions exactly analogous to those of the strong acids, but which did not redden litmus, and it became necessary to obtain a definition which should include these substances. At present an acid is described as a compound containing a certain quantity of hydrogen, easily replaceable by a metal when it comes in contact with it as an oxide. Thus the simplest acid which can be obtained is hydrochloric acid, represented by the formula HCl; and if this be brought in contact with metallic sodium, hydrogen is at once eliminated, thus:—

$$2HCl + 2Na = 2NaCl + H_2,$$

the sodium salt of hydrochloric acid, NaCl, known as sodium chloride or common salt, being produced. Here a simple interchange occurs, and the monad sodium takes the place of the monad hydrogen. Again, if a diad metal, such as zinc, is made to react on hydrochloric acid, it decomposes two molecules of that substance, according to the equation—

$$2HCl + Zn = ZnCl_2 + H_2.$$

A similar change will usually occur provided the metal employed forms a soluble salt with the acid. Should it not be so a salt can be obtained by using the oxide of the metal, when a double exchange takes place, and water is produced by the combination of the hydrogen of the acid with the oxygen of the oxide; metallic lead, for example, does not readily displace the hydrogen of hydrochloric acid, but if lead oxide be used, the chloride is at once obtained thus:—

$$PbO + 2HCl = PbCl_2 + H_2O.$$

The nature of the salt formed depends very much on the circumstances of the experiment. Thus, if iron be allowed to react on hydrochloric acid, that metal acts as a diad, displaces two atoms of hydrogen, and ferrous chloride is produced—

$$Fe + 2HCl = FeCl_2 + H_2;$$

and the same change occurs with the separation of water when hydrochloric acid acts on ferrous oxide, FeO. But if ferric oxide, Fe_2O_3, and hydrochloric acid react, six molecules of hydrochloric acid are required for the decomposition of one of ferric oxide, the change being thus represented:—

$$Fe_2O_3 + 6HCl = Fe_2Cl_6 + 3H_2O.$$

Hydrochloric acid, as already observed, is the simplest acid which exists, and contains only one atom of hydrogen replaceable by a metal, in combination with an element or simple radical. Nitric acid, HNO_3, is a more complex substance, in which the hydrogen is in combination with the group NO_3, and this group, in combination with metals, forms the class of nitrates completely analogous to the chlorides. Many acids, however, exist in which more than one atom of hydrogen replaceable by a metal is present, and in such cases a much greater variety of salts is possible. Thus, sulphuric acid, H_2SO_4, contains two of hydrogen, and phosphoric acid, H_3PO_4, three of hydrogen, replaceable by metals, and the consequence is that potassium, for example, can form with sulphuric acid two salts, $KHSO_4$ and K_2SO_4, which are called hydrogen-potassium and normal potassium sulphate. With phosphoric acid, again, three potash salts are possible, KH_2PO_4, K_2HPO_4, and K_3PO_4. Acids are classified according to the number of atoms of replaceable hydrogen which they contain, as monobasic, dibasic, and tribasic acids. In the cases selected for illustration the whole of the hydrogen contained in the acid can be replaced by a metal, but it by no means follows that this is invariably the case. Hypophosphorous acid, for example, is H_3PO_2, but only two of these atoms of hydrogen can be exchanged for a metal, giving the salts K_2HPO_2 and KH_2PO_2. The third atom of hydrogen is not replaceable by metals.

The acids can be produced by a variety of different processes. Thus, hydrogen and chlorine when mixed and exposed to the sun's rays, or to heat, at once combine; and phosphorus, when burned in moist air, yields phosphoric acid. But the acids are generally most conveniently obtained by the reaction of a less volatile acid on some of their salts. Nitric acid, for example, is produced by the action of sulphuric acid on potassium nitrate, according to the following equation:—

$$KNO_3 + H_2SO_4 = KHSO_4 + HNO_3.$$

And this process is modified so as to suit the requirements of each individual case.

Acid Anhydrides.—When an acid containing a radical of which oxygen is a constituent is submitted to the action of some substance having a powerful affinity for water, the whole, or part of its hydrogen, combines with oxygen and is separated as water, while the residual elements are left behind in the form of a compound called an anhydride. In general, however, owing to the extremely strong affinity which exists between the anhydrides and water, it is difficult, or impossible, to obtain them in this way, and other processes must be made use of. Thus phosphoric anhydride, P_2O_5, is produced when phosphorus is burned in air. Sulphuric anhydride, SO_3, may be obtained by distilling ferric sulphate, $Fe_2 3SO_4$, at a red-heat, when it breaks up thus:—

$$Fe_2 3SO_4 = Fe_2O_3 + 3SO_3.$$

The substances so obtained are entirely devoid of acid properties, and do not redden vegetable blues. They have in general an exceedingly powerful affinity for water, and unite with it instantaneously with the evolution of much heat to produce the acid. In some cases, however, the affinity between the anhydride and water is so slight that the acid is not known in the separate state. This is particularly the case with carbonic and sulphurous acids, the substances popularly known by these names being really the anhydrides of these acids.

Bases.—These are compounds which, by reacting on acids, yield salts. The most important bases are oxides of metals, and when brought in contact with an acid their oxygen combines with the hydrogen of the acid to form water. They are divided into several sections, of which the most important are the alkalies. These substances are the hydrates of the so-called alkaline metals, and may be compared to water in which an atom of hydrogen is replaced by an atom of metal. Potash, more correctly called potassium hydrate, is KHO. The alkalies are readily soluble in water, have a peculiar harsh taste, restore the blue colour of reddened litmus, and give a green with red cabbage, dahlia, and other vegetable blues, and convert the yellow of turmeric into a brownish red. Most of the bases, however, are insoluble in water, and without any effect on vegetable colours. Another class of bases which are of very great importance is typified by ammonia. This substance is a compound of nitrogen and hydrogen, NH_3; but the substance which acts as a base is NH_4HO, and is analogous to potassium hydrate, KHO, the metal potassium being replaced by the group NH_4, which plays the part of a metal and is called a radical. When an ammonium salt is formed the reaction is exactly similar to that which occurs with an alkali, as illustrated by the subjoined equations:—

Reaction between potassium hydrate and sulphuric acid.

$$H_2SO_4 + 2KHO = K_2SO_4 + 2H_2O.$$

Reaction between ammonium hydrate and sulphuric acid.

$$H_2SO_4 + 2NH_4HO = (NH_4)_2SO_4 + 2H_2O.$$

Bases analogous to ammonia form a large and important class of substances, but their relations can be best considered under the head of Organic Chemistry.

Indifferent Oxides.—There exists a class of oxides devoid of both acid and basic properties. The majority of these oxides are of little interest, but a few have very high practical importance. The most important is manganese dioxide, MnO_2, which is found abundantly native. When treated with hydrochloric acid, it undergoes a complex decomposition, and yields pure chlorine, thus:—

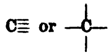
$$MnO_2 + 4HCl = 2H_2O + MnCl_2 + Cl_2;$$

on which account it is used for the preparation of chlorine. Many other such oxides undergo a similar change.

The most commonly occurring substances belong, for the most part, to one or other of the classes of compounds already mentioned. Comparatively few elements exist naturally in any quantity in the free state; these are chiefly oxygen, carbon, nitrogen, sulphur, and a few of the metals. The elements mainly occur as oxides or in metallic salts. Of the latter, the most common are certain sulphides, sulphates, nitrates, carbonates, and silicates, which latter form a most widely spread but somewhat complicated class of minerals.

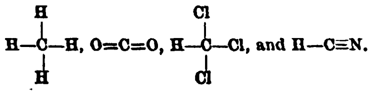
Organic Chemistry.—Carbon occupies an exceptional position among the elements owing to the remarkable number of compounds which it is capable of forming with hydrogen. While other elements form only one or two compounds with hydrogen, hundreds of compounds of carbon and hydrogen have been obtained. These compounds are called hydrocarbons. From them a vast number of substances may be derived, each containing carbon as an essential constituent. Many of these compounds, such as acetic acid and alcohol, were known in very early times; and it was believed that as these were always obtained from animal or vegetable matter, they could only be formed through the agency of some vital force. It was not till 1828, when Wöhler prepared a typical organic substance, urea, from inorganic materials, that this idea was abandoned. Since that time a great number of carbon compounds have been yearly produced in the laboratory, so that many thousands of them are now known. It is only because of their great number that it is found convenient to class them separately from 'inorganic' compounds. Organic chemistry, then, may be defined as the study of the compounds of carbon.

Constitutional and graphic formulæ: Isomerism.—In the case of an inorganic substance the determination of the nature and number of atoms composing its molecule is usually sufficient to characterize it: thus, it is sufficient to know that the molecule of sulphuric acid contains two atoms of hydrogen, one atom of sulphur, and four atoms of oxygen, as only one substance of the formula H_2SO_4 is known. Among organic compounds, however, many cases are met with in which two or more substances have the same molecular formula but possess entirely different properties. For instance, two substances having the formula C_2H_6O and five of the formula C_6H_{14} are known. Such substances are termed *isomers*, and the phenomenon is known as *isomerism*. The properties of a compound, therefore, depend not only on the nature and number of the atoms composing its molecule, but on the arrangement of those atoms. For this reason the determination of the structure of the molecule is one of the most important problems of organic chemistry. The carbon atom is invariably assumed to be tetravalent. This is expressed by writing the symbol thus:—



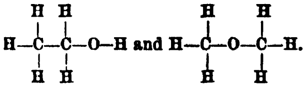
$$C\equiv \quad \text{or} \quad -\overset{|}{\underset{|}{C}}-$$

The formulæ CH_4, CO_2, $CHCl_3$, and HCN may be written thus:—



$$H-\overset{H}{\overset{|}{\underset{\underset{H}{|}}{C}}}-H,\ O=C=O,\ H-\overset{Cl}{\overset{|}{\underset{\underset{Cl}{|}}{C}}}-Cl, \text{ and } H-C\equiv N.$$

Formulæ of this kind are termed *graphic formulæ*, and the lines indicating the valencies of the atoms are known as *bonds* or *linkings*. By the aid of such formulæ the existence of two isomers C_2H_6O may be simply explained. Bearing in mind that carbon, oxygen, and hydrogen are respectively tetra-, di-, and monovalent, it is obvious that the only possible formulæ are—



$$H-\overset{H}{\overset{|}{\underset{\underset{H}{|}}{C}}}-\overset{H}{\overset{|}{\underset{\underset{H}{|}}{C}}}-O-H \text{ and } H-\overset{H}{\overset{|}{\underset{\underset{H}{|}}{C}}}-O-\overset{H}{\overset{|}{\underset{\underset{H}{|}}{C}}}-H.$$

The first of these is ascribed to ordinary alcohol and the second to methyl ether. These formulæ may be more simply expressed thus: CH_3CH_2OH and $CH_3.O.CH_3$. They are then termed *constitutional* or *rational formulæ*. The constitution of such substances is arrived at from a careful study of their chemical (and physical) properties, and from the methods of their formation.

Radicals.—Certain groups of atoms occur in a large number of compounds and remain intact when these undergo certain chemical changes. For example, methyl alcohol (CH_3OH) may be converted by various reactions into methyl chloride (CH_3Cl), methyl iodide (CH_3I), methyl nitrate (CH_3NO_3), and methyl-amine (CH_3NH_2). The methyl group (CH_3) is common to all of these substances, and behaves like a single atom. Such a group of atoms is called a *radical*. A few such radicals are: $(C_2H_5)'$ ethyl, $(OH)'$ hydroxyl, $(COOH)'$ carboxyl, and $(NH_2)'$ amidogen.

Classification.—So far as their constitution is known the carbon compounds may be divided into three classes:—

I. Aliphatic or Fatty Compounds.
II. Isocyclic Compounds, } Aromatic Compounds.
III. Heterocyclic Compounds, }

The Fatty Compounds.—It has been already mentioned that one of the most striking features of the chemistry of carbon is the large number of compounds which it forms with hydrogen. This property is explained by the remarkable power of linking together possessed by the carbon atoms and to their tetravalent nature. The simplest hydrocarbon has the formula CH_4. The next has the formula $CH_3.CH_3$, and the third is $CH_3CH_2CH_3$. The second of these is obviously formed from the first by the replacement of a hydrogen atom by the group CH_3, while the third is similarly obtained from the second. A glance at the formula of the third hydrocarbon will show that two isomers of the next higher compound (C_4H_{10}) are capable of existence. These may be produced by the same operation as the others, and will have the formulæ $CH_3CH_2CH_2CH_3$ and $CH_3CH{<}^{CH_3}_{CH_3}$. It will be seen by continuing this process, that as the number of carbon atoms increases, the number of possible isomers will increase rapidly. It has indeed been shown that no less than 802 isomeric hydrocarbons of the formula $C_{13}H_{28}$ are possible. Those in which the carbon atoms are arranged in a continuous chain are termed *normal* hydrocarbons. The following are the names of a few of the lower members of this series of hydrocarbons. Their general formula is C_nH_{2n+2}.

Name.	Formula.	No. of possible Isomers.
Methane	CH_4	1
Ethane	C_2H_6	1
Propane	C_3H_8	1
Normal-Butane Iso-Butane	C_4H_{10}	2
Normal-Pentane Iso-Pentane Tertiary-Pentane	C_5H_{12}	3
Hexanes	C_6H_{14}	5
Heptanes	C_7H_{16}	9
Octanes	C_8H_{18}	18
Nonanes	C_9H_{20}	35
Decanes	$C_{10}H_{22}$	75

Each member of the series differs from the preceding and succeeding member by the constant difference CH_2. Such a series is termed a *homologous series*. The names of the hydrocarbons of this series have the distinguishing termination *-ane*. On account of certain of their properties they are called *Paraffins*. The paraffins are found naturally in enormous quantities in certain varieties of petroleum, the lower members of the series are contained in certain natural gases. The chief sources of this petroleum are in North America; Russian petroleum consists largely of hydrocarbons belonging to another series. Shale is also a source of the paraffins. (See PARAFFIN, PETROLEUM.) The hydrocarbons contained in crude petroleum are partially separated by a process of fractional distillations. The first four members of the series are colourless gases, next come liquids of gradually increasing boiling-point, with increase in the number of carbon atoms. The higher members of the series are solids, the melting-point of which increases with the molecular weight. The paraffins are practically insoluble in water, but soluble in many organic liquids. A notable property of the paraffins is their great stability. They are not affected at ordinary temperatures by nitric acid, fuming sulphuric acid, alkalies, or by powerful oxidizing agents such as chromic acid. They are, however, attacked by chlorine and bromine with formation of *substitution* products; for instance, with chlorine, methane yields CH_3Cl, CH_2Cl_2, $CHCl_3$, and CCl_4. They are incapable of combining directly with any element. In other words, the valencies of their carbon atoms are all fully satisfied by hydrogen; they are therefore known as *saturated compounds*.

Unsaturated Hydrocarbons.—Many hydrocarbons are known which do not contain the maximum number of hydrogen atoms; these are consequently capable of combining directly with such substances as hydrogen, chlorine, hydrochloric acid, &c., forming *additive* products. Thus, ethylene (C_2H_4) yields $C_2H_4Br_2$, C_2H_5Cl, &c. Hydrocarbons of this kind are termed *unsaturated*. Of these there are two well-known series, the first one or two members of which are the most important.

Olefines, C_nH_{2n}.	*Acetylenes*, C_nH_{2n-2}
Ethylene, C_2H_4.	Acetylene, C_2H_2.
Propylene, C_3H_6.	Allylene, C_3H_4.

For certain reasons it is assumed that the carbon atoms in these substances are united by more than one bond, thus:— Ethylene $\begin{array}{c}CH_2\\ \| \\ CH_2\end{array}$, Acetylene, $\begin{array}{c}CH\\ ||| \\ CH\end{array}$. When such hydrocarbons yield addition products the double or treble bond is destroyed and a saturated compound is formed. For instance, with bromine, ethylene yields a dibromide, $\begin{array}{c}CH_2Br\\ | \\ CH_2Br\end{array}$, while acetylene yields a tetrabromide, $\begin{array}{c}CHBr_2\\ | \\ CHBr_2\end{array}$.

Of these hydrocarbons, acetylene has gained importance as an illuminant. It may now be economically produced from calcium carbide by the regulated action of water.

Alcohols.—These are obtained by the substitution of the hydroxyl radical (OH)′ for hydrogen of the hydrocarbon. The following are the names of a few of the monohydric alcohols. It will be observed that they form a homologous series.

			No. of Isomers.
Methyl alcohol......	CH_3OH	....	1
Ethyl alcohol........	C_2H_5OH	....	1
Propyl alcohols......	C_3H_7OH	....	2
Butyl alcohols.......	C_4H_9OH	....	4
Amyl alcohols.......	$C_5H_{11}OH$	....	8

Methyl alcohol is prepared from the products of the dry distillation of wood. Ethyl alcohol is produced in large quantity along with higher alcohols by the fermentation of saccharine liquids by means of yeast. The members of this series of alcohols up to $C_{12}H_{26}O$ are colourless liquids having a characteristic odour and a burning taste. The higher members of the series are solids. The lower alcohols only are soluble in water to any extent. The specific gravity and boiling-point increase as the series is ascended. By substituting hydroxyl for hydrogen in butane, alcohols of the following formulæ are formed:—

(1) $CH_3CH_2CH_2CH_2OH$. (2) $\begin{matrix}CH_3\\CH_3\end{matrix}\!>CH.CH_2OH$.

(3) $CH_3CH_2CHOH.CH_3$. (4) $(CH_3)_3\equiv C.OH$.

Alcohols which contain the group CH_2OH are termed primary, those containing the group CHOH are secondary, and those containing the group COH are tertiary alcohols.

Esters.—Alcohols are sometimes compared with metallic hydroxides because they react with acids forming *ethereal salts* or *esters*, as exemplified by the following equations:—

(1) $C_2H_5OH+HNO_3=C_2H_5NO_3+H_2O$
Ethyl nitrate.

(2) $C_2H_5OH+H_2SO_4=C_2H_5HSO_4+H_2O$
Ethyl hydrogen sulphate.

(3) $C_2H_5OH+C_2H_4O_2=C_2H_5.C_2H_3O_2+H_2O$
Ethyl acetate.

Many of these ethereal salts or esters are pleasant-smelling liquids, and are prepared commercially for use as perfumes and for flavouring purposes.

Ethers.—By treatment with dehydrating agents alcohols may be converted into *ethers*, thus:—

$$2\,CH_3OH=CH_3.O.CH_3+H_2O.$$

Strong sulphuric acid is commonly employed for this purpose. The substance known as sulphuric ether is ethyl ether, $(C_2H_5)_2O$. This is the most important member of the series, and is largely used as a solvent for fats, and as an anæsthetic. With the exception of methyl ether, which is a gas, the ethers are volatile, highly inflammable liquids, lighter than water. They are sometimes likened to the metallic oxides, *e.g.* K_2O. Chemically they are much more indifferent than the alcohols.

Aldehydes.—On oxidation, the primary alcohols yield two series of bodies, viz. aldehydes and acids, thus:—

(1) $CH_3CH_2OH+O=CH_3CHO+H_2O$.

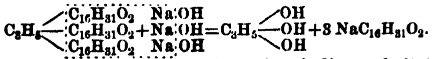
(2) $CH_3CHO+O=CH_3COOH$.

By the oxidation of ethyl alcohol, acetaldehyde is first produced, this is converted into acetic acid by further oxidation. Acetaldehyde and formaldehyde (H.CHO) are the most important members of this series. The latter substance is used under the name of formaline in photography, as a disinfectant, and in the manufacture of certain organic colours.

Secondary alcohols on oxidation yield ketones. For example, acetone is formed when isopropyl alcohol is oxidized—

$$CH_3CHOH.CH_3+O=CH_3COCH_3+H_2O.$$

Alcohols containing more than one hydroxyl group are known. Of these, the most common is glycerol or glycerine. Many natural fats and oils are ethereal salts of this substance with organic acids, such as stearic, palmitic, and oleic. Esters are capable of undergoing hydrolysis or saponification on treatment with alkalies. When fats are boiled with soda or potash they yield free glycerine and alkali salts of the acids, commonly known as soaps. The following equations represents this reaction with tripalmitin.



$$C_3H_5\begin{cases}C_{16}H_{31}O_2\\C_{16}H_{31}O_2\\C_{16}H_{31}O_2\end{cases}+\begin{matrix}Na.OH\\Na.OH\\Na.OH\end{matrix}=C_3H_5\begin{cases}OH\\OH\\OH\end{cases}+3\,NaC_{16}H_{31}O_2.$$

Glycerine. Sodium palmitate.

Generally speaking, soft soaps are potassium salts of oleic acid derived from seal and whale oils, while hard soaps are sodium salts of stearic, palmitic, and oleic acids obtained from tallow, palm oil, &c. Nitroglycerine is also an ethereal salt of glycerine. It has the formula $C_3H_5(NO_3)_3$. It is largely used in the form of dynamite as an explosive.

Amines.—These form an important class of bodies, which may be regarded as derived from ammonia (NH_3) by replacement of 1, 2, or 3 atoms of hydrogen by alkyl radicals. For example, we have methylamine ($NH_2.CH_3$), dimethylamine [$NH(CH_3)_2$], and trimethylamine [$N(CH_3)_3$]. These substances resemble ammonia in many properties. They are very strongly basic. Substances like trimethylamine (tertiary amines) form hydroxides like ammonium hydroxide (NH_4OH), for example, tetrethylammonium hydroxide [$N(C_2H_5)_4OH$]. These are prepared from compounds analogous to the ammonium salts, such as tetrethylammonium iodide [$N(C_2H_5)_4I$].

Fatty Acids.—The general formula for this important series of bodies is $C_nH_{2n+1}COOH$ or $C_nH_{2n}O_2$. The term 'fatty' is applied to these acids on account of the occurrence of some of the higher members in the natural fats. They may be formed, as already mentioned, by oxidation of the primary alcohols. At the ordinary temperature the lower members of the series are liquids soluble in water. This solubility decreases and the boiling-point increases as the series is ascended. From the acid $C_{10}H_{20}O_2$ upwards they are waxy solids insoluble in water. They are monobasic acids, and, with the exception of formic acid, are very stable substances. Formic acid ($H\,COOH$) is the lowest member of the series. It occurs in ants and in stinging nettles. Acetic acid (CH_3COOH) is prepared from the products of the dry distillation of wood; and, as vinegar, by the fermentation of dilute spirit. Several of the salts of acetic acid are of commercial importance. Of these may be mentioned the acetates of iron and aluminium, which are used as mordants in dyeing. Of the other members of this series butyric acid occurs in butter, while stearic and palmitic acids have been already referred to.

Other series of acids are known, the members of which contain more than one carboxyl group. Of these, oxalic ($COOH\,.\,COOH$), tartaric [$CH(OH)COOH\,.\,CH(OH)COOH$], and citric [$C_3H_4(OH)(COOH)_3$] acids may be mentioned. These substances or their salts occur naturally in many plants.

Carbohydrates.—To this group belong a number of naturally-occurring substances composed of carbon, hydrogen, and oxygen, in which the two latter elements are present in the same proportion as in water. They may be classified as sugars, starches, and celluloses. The most commonly known of the sugars is *cane-sugar*, $C_{12}H_{22}O_{11}$. It is extracted in very large quantity both from the sugar-cane and from beetroot, and is present in small quantity in many fruits. Cane-sugar possesses the remarkable property—shared by many naturally-occurring carbon compounds—of rotating the plane of polarized light. If an aqueous solution of sugar be warmed with a small quantity of a mineral acid the sugar is hydrolyzed, thus:—

$$\underset{\text{Cane-sugar.}}{C_{12}H_{22}O_{11}} + H_2O = \underset{\text{Dextrose.}}{C_6H_{12}O_6} + \underset{\text{Levulose.}}{C_6H_{12}O_6}.$$

The mixture of sugars thus obtained is known as invert sugar. In the preparation of alcohol from sugar a similar change is first brought about by means of a soluble ferment present in yeast known as invertin. The invert sugar is afterwards converted by the yeast into alcohol and carbon dioxide. *Dextrose* or *Glucose*, $C_6H_{12}O_6$, occurs in grapes—hence it is sometimes called grape-sugar. It is found in most fruits, and is almost invariably associated with an equal quantity of levulose as invert sugar. Glucose is not so sweet as cane-sugar. It is used commercially as a substitute for malt in brewing of beer, in the 'doctoring' of wine, in making syrups, &c. Many other sugars are known.

Starch $(C_6H_{10}O_5)_n$ is very widely distributed in the vegetable world. It occurs in large quantity in all kinds of grain and in many tubers. It is largely obtained from potatoes. When examined under the microscope starch is seen to consist of minute characteristically-striated granules, the shape and size of which vary considerably according to the source from which the starch is obtained. When boiled with dilute acids, starch is converted into dextrin $(C_6H_{10}O_5)_n$, then into dextrose: the former of these substances is used as a substitute for gum.

Cellulose $(C_6H_{10}O_5)_n$, forms the chief constituent of the cell membranes of plants. Cotton-wool, linen, and filter-paper, which have been freed from mineral matter, consist of almost pure cellulose. All the carbohydrates possess to a great extent the character of alcohols. Cellulose, for example, is capable of forming ethereal salts. Of these the nitrates are of great importance as explosives.

Cyanogen Compounds.—The cyanogen compounds form one of the most important series of organic substances. The simplest of these is hydrocyanic acid (prussic acid), which has the formula HCN. It is a volatile, colourless liquid, and is well known as a most terrible poison. The importance of the derivatives of this substance lies in the fact that the cyanogen radical $(CN)'$ is readily converted into the carboxyl group $(COOH)'$, thus:—

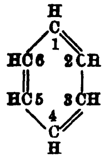
$$CH_3\,.\,CN + 2\,H_2O = CH_3COOH + NH_3$$

—a change which is of great value in many syntheses.

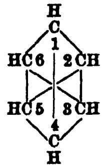
It must not be supposed that, in the hydrocarbons and their derivatives already mentioned, the carbon atoms are linked together in a straight line or in one plane. This is almost certainly not the case. It is supposed that the carbon atom lies, as it were, at the centre of a regular tetrahedron, and that the forces connecting it with other atoms are in the direction of lines drawn from the centre towards the solid angles of this figure. Molecules containing such atoms must have a somewhat complicated structure. This is a purely hypothetical conception; but it is supported by many considerations which cannot be discussed here. By means of this hypothesis the optical activity of many organic compounds and various other phenomena receive a satisfactory explanation. This conception was introduced almost simultaneously by Le Bel and Van't Hoff in 1874, and is one of the most fruitful hypotheses of recent times.

Aromatic Compounds.—The hydrocarbons already considered consist of *open* chains of carbon atoms. It may readily be supposed that the carbon atoms at the ends of such a chain might become united to one another and a *closed* chain or ring be produced. The *aromatic compounds* are believed to be thus constituted. When coal is subjected to dry distillation it undergoes exceedingly complex changes, a great variety of compounds being produced. This process is carried out on a very large scale in the manufacture of coal-gas and in blast-furnaces. The products of the distillation are gases such as ammonia, methane, ethylene, &c.; volatile liquids known as tar; and the residue of coke. The tar is subsequently distilled and yields many important substances in the different fractions. These are chiefly benzene, phenol or carbolic acid, naphthalene, anthracene, &c. They are all aromatic bodies, and are mostly derivatives of benzene. Benzene, C_6H_6, is a colourless liquid which boils at 80·5° C. It is highly inflammable and burns with a smoky flame. It is used chiefly for the manufacture of nitrobenzene; it is, besides, a very useful solvent. Chemically it is a very stable substance. Its properties are best explained from a consideration of its formula. Benzene was discovered by Faraday in 1825, but no constitutional formula for this substance was suggested until 1866, when Kekulé formulated his benzene theory, which has proved an inestimable boon to science and technology. Kekulé was the first to realize the possibility of a closed chain formation.

Many other formulæ have been suggested for benzene, but that of Kekulé must still be regarded as the most generally suitable to express its characteristic properties. The centric formula, devised by Armstrong, has been adopted by many chemists.



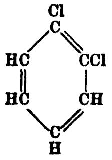
Kekulé's Formula.

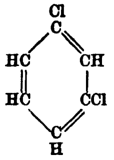


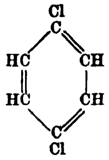
Centric Formula.

Owing to the curious nature of the benzene ring (or nucleus) the aromatic compounds possess many properties entirely different from those of the aliphatic compounds. Benzene derivatives are chiefly substitution products, but it is possible also to prepare addition compounds; in the latter case the double bonds disappear and the carbon atoms become saturated.

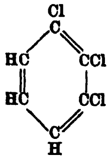
Isomerism.—The hydrogen atoms may of course be replaced either partly or wholly by radicals. Take, for example, the chlorine derivatives. Only *one* mono-chloro-benzene is known. But with di-derivatives the case is different. No less than three isomers exist. A glance at either of the above formulæ will show that this is possible owing to the different relative positions which the substituting radicals may assume. Positions 1:2, 1:3, and 1:4 are obviously different, while positions 1:6 and 1:5 are the same as 1:2 and 1:3 respectively. Thus three di-chloro-benzenes are known, having the formulæ—

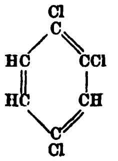


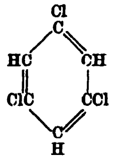




Such compounds are respectively called ortho, meta, and para derivatives. Similarly in the case of tri-substitution products where the substituting groups are all of the same kind, three isomers are possible, and have the formulæ—







This kind of isomerism is of course peculiar to ring compounds. Isomerism may also exist in the 'side-chains', as in the aliphatic compounds.

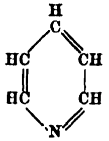
Homologues of Benzene.—These have the general formula C_nH_{2n-6}. The second member of the series, toluene, $C_6H_5.CH_3$, being a mono-derivative of benzene, exists only in one form. But the next homologue exists in four isomeric forms; three of them being ortho-, meta-, and para-dimethylbenzene, or xylenes, and the fourth ethylbenzene. The number of isomers rapidly increases on passing up the series.

The halogen derivatives are obtained by substituting hydrogen in the nucleus or in the side-chain. Many isomers may thus be obtained. One of the most characteristic properties of the aromatic bodies is the ease with which nitro-groups (NO_2) may be substituted for hydrogen in the nucleus: for example, benzene readily yields nitro-benzene, $C_6H_5NO_2$. This class of derivatives is of the utmost importance, because they may be readily converted by reduction into amido-bodies.

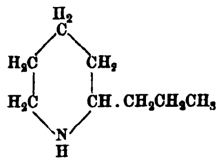
Aniline, $C_6H_5NH_2$, is thus prepared from nitrobenzene. It is a colourless oil, boiling at 183° C., which possesses basic properties. It is very largely employed in the manufacture of dyes. A valuable property of such amido-compounds is that they are capable of being converted into *diazo-compounds* by treatment with nitrous acid. Thus, aniline hydrochloride yields diazo-benzene-chloride, $C_6H_5N{:}NCl$, which is somewhat unstable and is readily converted into various valuable substances.

Phenol or carbolic acid, C_6H_5OH, is one of the chief substances contained in coal tar. Although a hydroxy-compound, it differs considerably from aliphatic alcohols. The true aromatic alcohols are not generally of much importance. They are formed by replacement of hydrogen in the side-chain by hydroxyl radicals. The phenols, on the other hand, are derived from the aromatic hydrocarbons by replacement of hydrogen in the nucleus. Phenols do not form aldehydes or ketones on oxidation. These substances may, however, be obtained by other means. The aromatic acids may be obtained by substitution of hydrogen by carboxyl groups, either in the nucleus or in the side-chain. Benzoic acid, $C_6H_5.COOH$, is the simplest of these.

Pyridine may be cited as an example of a heterocyclic compound. Its formula is—



Such compounds are especially interesting from the fact that some of the alkaloids, coniine and cocaine for example, may be regarded as derivatives of them. The former substance is given the formula—



Commercially the aromatic compounds are of great interest, because most of the principal dyes used at the present day are derived from them.

The development of physical chemistry has made rapid strides within recent years. This branch of the subject is of great assistance, especially in arriving at the constitution of compounds, owing to the undoubted relationships existing between constitution and physical properties. Enough has been said to give some idea of the vast extent of this subject, which, from its many-sided aspects and its importance as the foundation of numerous industries, is rendered not the least attractive of all the sciences.

CHEMISTS. Pharmaceutical Chemists are all those who, after passing the necessary examinations, are registered as such by the Pharmaceutical Society of Great Britain. This society was incorporated by royal charter on the 18th of Feb. 1843, and its charter was confirmed and its constitution modified by the act of 1852. This act empowers the society to appoint competent examiners to examine all persons presenting themselves in Latin, botany, materia medica, and pharmaceutic and general chemistry, with other cognate subjects, but not including the theory and practice of medicine, surgery, or midwifery.

Another clause declares that no member of the medical profession or practitioner, by degree or diploma, is entitled to be registered as belonging to the Pharmaceutical Society, and any person registered who acquires such a position must have his name removed from the register. This act does not render it illegal for any person who is not registered to vend and compound medicines and to make up medical prescriptions, but forbids under a penalty anyone not so registered to assume the title of pharmaceutical chemist; and thus the effect of the act is to afford a guarantee to the public that anyone so calling himself has had his skill and knowledge tested by duly qualified examiners.

CHEMISTS AND DRUGGISTS.—By the act of July 31, 1868, relating to the sale of poisons, a special meaning is given to the title of chemist and druggist, only those being entitled to be registered as such within the meaning of the act, who before the passing of the act had carried on the business of a chemist and druggist, in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners, those who are duly registered as assistants and associates under the pharmacy act of 1852, and those who should produce, on or before the 31st Dec. 1868, a certificate that they had been actually engaged in dispensing prescriptions as assistants to a pharmaceutical chemist, or a chemist and druggist as defined in the act, and should pass such modified examination as the council of the Pharmaceutical Society, with the consent of the privy-council, might deem sufficient. The act also declares registered chemists and druggists in business at its passing to be eligible as members of the Pharmaceutical Society, but such members are not entitled to a place on the register of pharmaceutical chemists. All persons not duly registered are forbidden under a penalty to keep open shop to retail, dispense, or compound poisons, or to use the title of chemist, druggist, pharmaceutist, &c. The act, however, does not interfere with the business of any legally qualified apothecary, nor with the making of and dealing in patent medicines.

CHEMNITZ, the principal manufacturing town in the Kingdom of Saxony, on the Chemnitz, 39 miles s.w. of Dresden. It is rapidly growing in size and importance, and the greater part of it is of recent erection and well built. The few buildings of note include the old town-hall, the Protestant churches of St. James and St. John, the court-house, the royal gymnasium, and other educational institutions, the castle, and the huge railway-station. Chemnitz, 'the Manchester of Saxony', is a centre of the cotton manufacture in almost all its branches, and woollens and mixed fabrics are also made to a large extent, as well as cotton and woollen hosiery, woollen gloves, &c. There are extensive dye-works, print-works, bleach-works, chemical-works, and many others. The manufacture of machinery has become important, not only locomotives and steam-engine boilers being manufactured, but also machines used in spinning and weaving, sewing, knitting, embroidering, brewing, mining, and boring, machine tools, agricultural machines, turbines, &c. It is a place of considerable antiquity, a church having been built here in 938. It was made a city in 1125. Pop. in 1895, 161,017; in 1900, 206,584.

CHEMNITZ, MARTIN, a distinguished Protestant theologian, was born at Treuenbrietzen, Brandenburg, Nov. 9, 1522, of poor parents; received his education at Magdeburg and Frankfort on the Oder, and in 1544, to obtain the means of continuing his studies at Wittenberg, became a schoolmaster in Wriezen. In 1550 he became librarian to Duke Albert of Prussia. He then wrote his Loci Theologici, a valuable commentary on Melanchthon's system of dogmatics. Being invited to Brunswick, as minister, he attacked the Jesuits in his Theologiæ Jesuitarum Præcipua Capita (1562), and, when the Council of Trent thought itself assailed in this work, he wrote his Examen Concilii Tridentini, a work of great historical value. He gradually became attached to the Lutheran doctrines as distinguished from those of Melanchthon. He died April 8, 1586, at Brunswick.

CHEMOSH, the national god of the Moabites, who were on that account called 'the people of Chemosh' (Num. xxi. 29; Jer. xlviii. 46). In Judg. xi. 24 Chemosh is mentioned as the god of the Ammonites, but the whole narrative here applies to Moab, and not to Ammon. Milcom was the national deity of the Ammonites. The Moabite Stone (which see) was erected to commemorate victories achieved by the aid of Chemosh. In the inscription upon it Ashtar-Chemosh is mentioned, apparently a goddess associated with Chemosh. Human sacrifices seem to have been occasionally offered up to Chemosh (2 Ki. iii. 26, 27). The worship of Chemosh was introduced among the Hebrews by Solomon, who 'built an high place for Chemosh, the abomination of Moab, in the hill that is before Jerusalem' (1 Ki. xi. 7). Some have identified Chemosh with the sun, others with Saturn, while still others have regarded him as a war-god.

CHENAB, a river of Hindustan, in the Punjab, which has its source in the snowy Himalayas of Cashmere. It first receives the Jhilam from the right; then the Ravi from the left; still lower down it is joined by the Satlej, also on the left; after which the united streams, under the name of the Panjnad, fall into the Indus near Mithankot. (See PUNJAB.) Its length is about 800 miles.

CHÉNIER, ANDRÉ-MARIE, son of a French consular officer and author, born at Constantinople on Oct. 30th, 1762, went to France when very young, and entered the army, but left six months after to devote himself to literary pursuits. He was for about three years secretary to the French embassy at London, but in 1790 returned to Paris. Advocating the doctrine of a limited monarchy, he made himself equally offensive to the Royalist and the Jacobinical party. In consequence of his attacks on the Jacobins he was condemned by the revolutionary tribunal, and executed 20th July, 1794. Although but little known in his own day, Chénier has long been regarded as one of the finest French poets of his century, his chief characteristics being purity of form combined with vigour of thought and diction. He wrote idyls, elegies, odes (including one to Charlotte Corday), dithyrambs, philosophic pieces, &c.—MARIE JOSEPH BLAISE, his brother, born April 28th, 1764, served as an officer of dragoons, left the service, and devoted himself to literary pursuits. He was chosen a member of the Convention, where he belonged to the party of the most violent Democrats. He died in Paris on Jan. 10th, 1811. He also was an author, his chief works being dull tragedies.

CHENONCEAUX, a village of France, in the department of Indre-et-Loire, 7 miles to the south of Amboise, with a château which is one of the finest monuments of the Renaissance period. It was founded in 1515, is almost entirely built on piles in the middle of the Cher, and belonged successively to Francis I., Henry II., Diana of Poitiers, Catherine de' Medici, and others.

CHENOPODIUM (*goosefoot*), a genus of plants belonging to the natural order *Chenopodiaceæ*, and distinguished by its hermaphrodite flowers, having five small green scales for the calyx, about five stamens, no corolla, and a fruit consisting of a membranous skin inclosing one black, flat, and shining seed. A number of the species have received the name of goosefoots, from a fancied resemblance to the webbed foot of the goose. The best known or more remarkable species are—1. *C. rubrum* (red goosefoot), a common annual, generally found in muddy ground. It has a leafy angular stem, which, as well as the whole plant, is often red. It bears a great number of black seeds, not larger than grains of sand, which are much fed on by birds, and seem to be relished by poultry. 2. *C. Bonus Henricus* (good King Henry, or wild spinach), a perennial, not uncommon in country churchyards, and places seldom disturbed. It has bright-green, broad, succulent leaves, which formed our native spinach, and were in common use before the introduction of the present cultivated plant. The early shoots are sometimes used as a substitute for asparagus. 3. *C. Quinoa*, the quinoa of Peru, a perennial inhabiting the high table-land of the Cordilleras, where, at the conquest of the Spaniards, it was the only farinaceous grain used as food. It is still largely cultivated for its nutritious seeds, which are made into soup and bread, and when fermented with millet make a kind of beer. The plant is from 4 to 6 feet high, and has many angular branches, dull glaucous leaves, of a jagged triangular outline, on long narrow stalks, and flowers forming large compact branched heads, and succeeded by minute strong flat seeds, of a black, white, or red colour. The quinoa has been introduced into Europe, and is perfectly suited to the climate of England; but the grain has an unpleasant acrid taste, and will not be used as human food when anything better can be got. It is, however, an excellent grain for poultry, makes good green food for cattle, and being of easy cultivation may not be without economical value. Very large crops of seed have been grown in France.

CHEOPS, the name given by Herodotus to the Egyptian despot whom the Egyptians themselves called Chufu. He belonged to the fourth dynasty of the rulers who had for their capital Memphis. He built the largest of the pyramids. He is called by Diodorus Chembis, or Chemmis. See PYRAMIDS.

CHEPHREN, or CEPHREN, in ancient times a king of Egypt, the successor of Cheops and the builder of the second pyramid. The former is the form of his name as it is found in Herodotus, the latter is the name given to him by Diodorus. Herodotus informs us that his reign was in all respects as tyrannical as that of his predecessor, and that the Egyptians, animated by a feeling of hatred against these two kings, under whom they had suffered all kinds of oppression, and during whose reigns the temples had never been opened, avoided even the mention of their names; and hence, instead of naming the pyramids after their builders, named them after a shepherd called Philition, who used the land in the neighbourhood of the pyramids for pasturage. Diodorus adds that the pyramids were intended to serve as tombs for their builders, but as the people threatened to break them open and remove the bodies both the kings desired their friends to bury them in some spot where their bodies might remain undisturbed. Herodotus makes Chephren the brother of Cheops; but Diodorus says that Chembes, who is the Cheops of Herodotus, was succeeded by his son Chabryis, who may perhaps be the same with the Chephren of Herodotus. His reign lasted fifty-six years.

CHEPSTOW, a town and port in England, county Monmouth, on the Wye and the South Wales Railway, 14 miles N. by W. of Bristol; population in 1901, 3067. It is pleasantly situated on a slope descending gradually to the river, and has spacious, well-paved, and well-lighted streets. The principal edifices are the church, a fine specimen of Norman architecture, and the old castle, the ruins of which crown a lofty cliff overhanging the Wye. Owing to the great rise of the tide the river allows large ships to reach the town. The building of iron steamships is actively carried on, employing 400 hands. The salmon fishery is also of some importance. The beauty of the environs is an increasing attraction to visitors. Both the town and the castle are referred to in Domesday Book, and the castle was the last English fortress to be besieged.

CHEQUE, a draft or bill on a bank payable on presentation. A cheque may be drawn payable to the bearer, or to the order of some one named: the first form is transferable without endorsation, and payable to any one who presents it; the second must be endorsed. Cheques are a very important species of mercantile currency wherever there is a well-organized system of banking. The regular use of cheques for all payments except of small amount, which is universal in London and other large towns of England, by making the transfer of funds a mere matter of cross-entries and transferring of balances among bankers, tends greatly to economize the use of the precious metals as a currency. In order to facilitate the use of cheques as a means of transferring funds, the London bankers some time since introduced a plan which has become general over the country of crossing cheques, as it is called, for security of transference. A crossed cheque has two lines drawn across it transversely, with or without the words '& Co.' at the end of the transverse lines. A cheque thus marked can only be paid by the banker on whom it is drawn when presented by some other banker, and the person to whom it is sent can consequently only obtain payment of it through his own bankers. When a crossed cheque is lost it is of no value to the finder; and the loser, after giving notice to the banker, has only to draw another. There is a penny stamp required on all cheques.

CHEQUY, CHECKY, or CHEQUERED, in heraldry, applied to a field or charge when it is divided into squares like those of a chess-board.

CHER, an inland department, France, having on the N. Loiret, E. Nièvre, S. Allier, and W. Indre and Loir-et-Cher, between lat. 46° 26′ and 47° 38′ N., and lon. 1° 50′ and 3° 3′ E., and formed of parts of Berry and Bourbonnais. It is named from the river Cher, which traverses it S.E. to N.W. Area, 7199·34 square kilometres, or 2779 square miles; capital, Bourges. This department is included in the basin of the Loire, which forms the greater part of its E. boundary. The surface is in general flat, but is diversified in the N. by chains of inconsiderable hills. Soil various, but fertile in the neighbourhood of the Loire and Allier. Heath and sand prevail in the N. districts. The forests occupy above a sixth of the area, and furnish large quantities of fuel for the iron-works, and timber for ship-building. Pastures extensive, and sheep very numerous. More grain and wine are produced than the demands of the inhabitants require. Hemp and chestnuts are also largely cultivated. The best wines are those of Chanignol and Sancerre; and in ordinary years only the spoiled wine is distilled Beet-root, buckwheat, flax, and hemp are also grown. Bees are reared to a considerable extent. The minerals consist of iron, lithographic stones, good building and grind-stones, flint, marble, ochre, and potter's earth. The preparation and manufacture of iron, called Berry-iron, is the principal branch of industry. The manufactured articles are metal goods, fine and common cloth, woollen goods, porcelain and earthenware, sacking, beet-sugar, nut-oil, paper, and glass. The department is divided into three arrondissements, twenty-nine cantons, and 290 communes. Pop. in 1896, 347,725.

CHERASCO (ancient *Clarascum*), a town, Italy, Piedmont, in the province of Cuneo, near the confluence of the Stura and Tanaro, 22 miles N.E. Coni, with 3500 inhabitants. Its fortifications, once of great strength, were demolished by the French in 1801. It was repeatedly the object of contest between the French and Austrians in the wars of Italy, terminated in 1631 by a peace concluded here; and in 1796 Napoleon, by what is called the Armistice of Cherasco, obtained a free passage for his troops through the Sardinian States. The town is well built, and has several silk-mills.

CHERBOURG, a strongly-fortified arsenal and seaport of France, in the department of La Manche (The Channel), 196 miles W.N.W. Paris, on the north coast of the peninsula of Cotentin, and nearly due south of Southampton. It consists of the old or civil town, and the new or military (Port Militaire), the latter quite distinct from the former, and separated from it by the fortifications with which it is surrounded. Apart from its consideration as a naval station, Cherbourg is unimportant; it is the works by which it has been converted into a great naval fortress and place of arms that give it its special importance. These altogether have cost £8,000,000, and were chiefly carried out under Napoleon I., Louis Philippe, and Napoleon III. Foremost among them must be mentioned the *digue*, or breakwater, stretching across the entrance to the roadstead, which was formerly open to heavy seas from the north. It is more than two miles in length, of very massive construction, and consists of a western or longer and an eastern or shorter portion, forming at their junction a very obtuse angle pointing towards the north. Here there is a fort and lighthouse, and there are also a fort and lighthouse at either end. The breakwater alone cost about £2,700,000. The eastern entrance to the harbour, between the breakwater and the island Pelée, is about 500 yards wide; the western entrance, between the breakwater and Fort Chavagnac (on a rocky islet), is about 1000 yards, with a depth of 36 feet. It is the latter that large ships of war make use of. The Port Militaire has three great basins for war vessels—an outer accessible at all states of the tide for vessels of the largest class; a floating basin communicating with this by gates; and a third communicating with both by similar gates. The aggregate water area of the three basins is about 56 acres, the depth of water being from about 30 to 50 feet. They have been excavated from the solid slate rock which forms the foundation of the entire dockyard, much of the excavated material being used in the construction of the breakwater. There are also slips for vessels of the largest dimensions, dry docks, building-sheds, mast-houses, boiler-works, and in short everything necessary for the building and fitting out of ships of war. The numerous forts and other works with which Cherbourg is defended render it, if not impregnable from the sea, at least very difficult of attack. The commercial town has quite a modern aspect, the streets being generally wide, regular, well paved, and clean, but is rather dull and uninteresting. The hôtel de ville, or town-hall, contains a good collection of paintings and a library. There is an outer harbour, entered from the sea by a passage between two jetties, and an inner harbour or floating dock. The principal industry of Cherbourg is centered in the works of the dockyard, the commercial trade and manufactures being comparatively small. There are, however, dye-works, print-works, tanneries, foundries, saw-mills, &c. A considerable quantity of agricultural produce is exported, including large numbers of eggs for England.

Cherbourg is supposed to occupy the site of a Roman station, which is said to have borne the name of Cæsaris Burgum. Aigrold, king of Denmark, we are told, resided here about A.D. 945. William the Conqueror founded an hospital in it, and built the castle church. The English held possession of the place till about 1200. The castle, in which Henry II. frequently resided, was one of the strongholds of Normandy, and escaped the fate of the town, which, about 1295, was pillaged by an English fleet from Yarmouth; but it sustained afterwards three memorable sieges, in 1378, 1418, and 1450. In 1758 the town was taken by the English without opposition, notwithstanding that the garrison was large. They kept possession of it eight days, destroyed the fortifications, carried off the artillery and the bells, and only retired after having exacted a heavy ransom from the inhabitants. The completion of the fortifications was celebrated by Napoleon III. in 1858, the festivities being graced by the presence of Queen Victoria, and a statue of Napoleon I. being unveiled on the occasion. P. (1896), 40,783; (1901), 42,952.

CHERBURY, LORD. See HERBERT (EDWARD).

CHERIBON, a province or residency in the island of Java, on the coast towards the N.W., lying between Krawang and Tegal. It was formerly an independent kingdom. Pop. (1893), 1,500,529. The productions are coffee, timber, cotton, areca-nuts, indigo, sugar, and also a little pepper. The rhinoceros is seen on the hills and in the forests in this district. The horses are small and well made, but vicious. The capital of the province is of the same name. It lies in a deep bay on the north coast, at the mouth of the river Cheribon. The houses, except those of the Dutch residents and the sultan, are of bamboo. The finest tomb in Java, that of Mulano, who introduced Mohammedanism into the island, A.D. 1406, and is now revered as a saint, stands close to the town. Pop. about 15,000.

CHERITH, the name of a brook to which Elijah was sent during a portion of the years of famine (1 Kings xvii. 3–7), but the locality of which is no further designated than that it was before or on the face of Jordan. The most probable opinion is that it is to be sought for on the east side of the Jordan.

CHERKASK, or TCHERKASK, two towns of Russia, in the government of the Don Cossacks, called Old and New Cherkask, or Staro-Cherkask and Novo-Cherkask. The former is on the right bank of the Don; the latter is 11 miles further north, on a hill above the Aksai. Old Cherkask, a very ancient place, the foundation of which is attributed to a Greek colony, is situated on an island formed by the Don, the Aksai, and one of its branches, and is built on piles, as a protection from the inundations which continue from the beginning of April till the end of June. It is now an unimportant place compared with New Cherkask, which was founded in 1805, has a large cathedral and various other churches, elementary and higher schools, a theatre, &c., and carries on a considerable trade. It is the seat of government of the Don Cossacks. Pop. 38,476.

CHEROKEES, a tribe of North American Indians in the United States, occupying an allotted region in the Indian Territory. They are the most enlightened of the Indian tribes, have for the most part embraced Christianity, and have made so much progress in civilization that a native newspaper is circulated among them. They are governed by their own laws, and very jealous of their liberties. Their numbers are about 16,000.

CHERRY. The cherry is a fruit of the prune or plum tribe, the original stock of which is the wild cherry (*Prunus cerasus*). Besides being prized for its fruit the cherry is also a very ornamental tree, and is much cultivated for this reason in shrubberies.

It is a native of most temperate countries of the northern hemisphere. The small black is found not only in some parts of England, but even in places among the Scottish mountains, where it would be difficult to imagine it to have been carried. It is generally said that the first of the present cultivated sorts was introduced about the time of Henry VIII., and was originally planted at Sittingbourne in Kent; but that cherries of some sort were common in England long before this is sufficiently evidenced by Lydgate's London Lack-penny, a poem belonging to the early part of the fifteenth century, in which cherries are spoken of as being hawked about on the streets of London. Pliny says that the cherry was introduced into Britain about A.D. 46. The wild cherry, of which there are a good many varieties, is a much more hardy tree than any of those that produce the finer sorts of fruit, and it is therefore much cultivated for stocks upon which to engraft the others. At some of the ruined abbeys and baronial castles there are found cherry-trees, chiefly black ones, which have attained the height of 60 or 80 feet, and produce great quantities of fruit. The cherry is said to have been sent to Rome from Armenia by Lucullus, when engaged in the war against Mithridates (B.C. 74); and the word cherry is believed to be a corruption of Cerasus, the name of an ancient town on the Euxine or Black Sea. The gradual effect of cultivation on the cherry has been the production of numerous kinds, which, both in size and flavour, greatly exceed the fruit of the parent stock. The kinds that are best known are the May-duke, white-heart, and black-heart cherries.—The trees are propagated by grafting them usually upon the stocks of wild black and red cherry-trees, which are reared for that purpose. This agreeable fruit is eaten fresh or dried. It is sometimes preserved with sugar as a sweetmeat, made into jam, used in the preparation of the liquor called cherry-brandy, and made into wine. From wild black cherries or other kinds the liqueurs *kirschwasser* and *maraschino* are prepared, the former especially in Germany, the latter in Dalmatia. The wood of the cherry-tree, which is hard and tough, is much used, particularly by turners and cabinet-makers in many places. The gum that exudes from the bark is in some respects equal to gum-arabic, and is considered nutritive. Some botanists place the cherries in the genus *Cerasus*, making it separate from *Prunus*, and some regard the wild cherries of Britain as forming two species, others as one. The name *gean* is commonly given to the wild cherries, especially in Scotland. The bird-cherry (*Prunus padus*) is a very ornamental tree from its purple bark, its white flowers, and its berries, which are successively green, red, and black. It is a native of Britain and many parts of Europe, and its berries are sometimes infused in spirits to give them an agreeable flavour. The fruit is greedily eaten by birds. The wood is used for cabinet-work. The American species *P. Virginiana*, a much larger tree, is closely allied to this.

CHERRY-LAUREL (*Cerasus lauro-cerasus*), a shrub closely allied to the common cherry, but having evergreen leaves. It was introduced into Britain in the sixteenth century, and is well known as an ornamental shrub. It yields the celebrated laurel-water. This is a powerful poison, the strength of which (like that of peach-kernels, bitter-almonds, cherry-leaves, &c.) depends upon the presence of prussic acid. Laurel-water is obtained from the leaves and flowers, or the leaves only, of this plant, by distillation. This shrub is often called the common laurel, another evergreen species being distinguished as the Portugal laurel: both are distinct from the true laurel (which see).

CHERSON. See KHERSON.

CHERSONESUS (Greek, a peninsula). This name has been given to several peninsulas, as, 1. the Cimbrian Chersonesus (*Chersonesus Cimbrica*), now Jutland, &c. (see CIMBRI); 2. the Taurian Chersonesus (*Ch. Taurica*, also called *Magna*), the peninsula formed by the Black Sea and the Sea of Azoff—the Crimea; 3. the Thracian Chersonesus (*Ch. Thracica*, or merely *Chersonesus*), the great peninsula in Thrace, now the peninsula of the Dardanelles; 4. the Golden Chersonesus (*Aurea Ch.*), in India-beyond-the-Ganges, supposed to be the Malay Peninsula.

CHERTSEY, a town of England, county of Surrey, 20 miles s.w. of London, on the South-western Railway, is pleasantly situated on the right bank of the Thames, over which there is a handsome bridge, connecting it with the north or Middlesex side of the river. The houses are mostly of brick, and in general well built. The church of St. Peter has a square embattled tower, and contains a tablet to the memory of Charles James Fox. A school was founded here by Sir William Perkins, in 1725, for clothing and educating twenty-five girls and twenty-five boys. It is now converted into a public elementary school. There was here formerly a monastery of the Benedictine order, in which Henry VI. was interred, and where his remains lay till removed to Windsor by Henry VII. The chief industries are iron-founding, engineering, boat and steam-launch building, carriage-building, and cabinet-making. Vegetables are cultivated for the London market. Chertsey gives name to a parl. div. Pop. (1891), 11,298; (1901), 12,762.

CHERUB, in the plural CHERUBIM, the name of certain mystic appearances, or composite figures, which are first mentioned in connection with the expulsion of our first parents from the garden of Eden, where it is said that 'the Lord God placed at the east of the garden of Eden the cherubim, and a flaming sword, which turned every way, to keep the way of the tree of life.' Cherubim are frequently mentioned in connection with the building of the tabernacle and the temple of Solomon. Figures of cherubim were interwoven with the hangings and curtains of the former at various parts, in place of which there were in the latter solid figures of cherubim of fine wood overlaid with gold. Both in the tabernacle and in the temple the ark of the covenant in the holy of holies was surmounted by two cherubim, one at each end of the lid, having their wings outspread and meeting in the middle, so as to form a covering over the ark, and with their faces looking downwards upon the mercy-seat. As to the form of cherubim the representations that we find at one place do not always entirely correspond with those given at another. For example, the cherubim seen by Ezekiel beneath the throne of God are represented as having each four faces and four wings, while in the cherubim carved upon the walls of his figurative temple two faces only are ascribed to each. With these and other circumstantial differences, however, there are certain marked characteristics that seem always to belong to cherubim, whenever we have the means of forming to ourselves a picture of their appearance. One is that they are composite animal forms; and when these animals are specified, they always consist of the likeness of man, the lion, the ox, and the eagle. Another marked characteristic is the prominence of the human form. Hence by the Jews and the early Christians they were considered as angels, and in Christian art are represented as figures wholly or partly human, with wings proceeding from the shoulders.

CHERUBINI, MARIA LUIGI CARLO ZENOBIO SALVATORE, one of the most eminent composers of modern times, born at Florence in 1760, gave early indications of musical talent, and after receiving the rudiments of his musical education from his father, studied under Bartolomeo Felici and his son Alessandro, and afterwards under Pietro Bizzari and Giuseppe Castrucci, and, when only thirteen, appeared as a composer in his native city. Patronized by Leopold, archduke of Tuscany, he continued his musical studies under Sarti in Bologna, and soon rose into such favour with his master as to be intrusted with the composition of some of the minor parts of his operas. His first opera, Quinto Fabio, was produced in Alessandria in 1780, and in Rome (in an altered form) in 1783, with such success as to spread his fame over Italy. He afterwards proceeded to London and Paris, and made himself familiar with the noble productions of Haydn and Mozart. He finally settled in Paris, where he became director of the École Royale in 1822, and died in 1842. Among his compositions may be mentioned Iphigenia in Aulide, Lodoiska, Faniska, Les Deux Journées, &c. In his later years he confined himself almost exclusively to the composition of sacred music, and gained a lasting fame by his Coronation Mass, and more especially his gorgeous Requiem.

CHERUSCI, the most celebrated of all the German tribes. It is difficult to determine their exact position, owing to the fact that ancient writers sometimes confound the national league formed by the Cherusci with the tribe, properly so called. It seems probable, however, that the tribe was situated in that part of Germany lying between the Weser and the Elbe, and having the Harz Mountains on the N., and the Sudetic range on the S. This tribe was known to the Romans before 50 B.C., and is mentioned by Cæsar as a people of equal importance with the Suevi. Their territory was first entered by the Romans under Drusus, the stepson of Augustus; and a year or two later they entered into an alliance with the Romans, and served in their armies. But when Varus attempted to make them tributary to Rome, and subject them to the Roman laws, they formed a confederation with many smaller tribes, and having decoyed Varus into the forest of Teutoburg, destroyed his whole army in a battle which lasted three days, and in which he himself was slain (A.D. 9). (See ARMINIUS and GERMANY.) Upon this the Cherusci became the chief object of the attacks of the Romans. Germanicus, victorious over the Marsi and Chatti, marched against the Cherusci, whose leaders, Segestus and Arminius (the latter of whom had carried off the daughter of the former), were at war with each other. Segestus, pressed by Arminius, called Germanicus to his aid, who delivered him, indeed, from his danger, but was obliged to return after several campaigns without having obtained any permanent advantages. In the end the Cherusci were overcome by the Chatti in the second half of the first century of our era; but this seems to have been owing more to internal dissensions among themselves than to any natural superiority in their opponents. Before the end of the fourth century they appear as members of the great confederation of the Franks, and after that they are lost sight of. (Smith's Dictionary of Geography.)

CHESAPEAKE BAY, a spacious bay of North America, in the states of Virginia and Maryland. Its entrance is between Cape Charles and Cape Henry, 16 miles wide, and it extends 180 miles to the northward, through the states of Virginia and Maryland, dividing them into two parts, called the *eastern* and *western shores*. It is from 10 to 30 miles broad, and at most places as much as 9 fathoms deep, affording many commodious harbours, and a safe and easy navigation. It receives the Susquehanna, Potomac, Rappahannock, York, and James Rivers, which are all large and navigable. The Chesapeake and Delaware Canal, and the Dismal Swamp Canal afford, in connection with Chesapeake Bay, an extensive inland navigation from north to south.

CHESELDEN, WILLIAM, a celebrated English surgeon and anatomist. He was born in Leicestershire in 1688, and after a common school education, and some medical instruction in the country, he went to London to prosecute his studies. At the age of twenty-two he began to give lectures on anatomy, and in 1711 he was chosen F.R.S. In 1713 he published a treatise on the Anatomy of the Human Body, 8vo, long esteemed a favourite manual of the science. He continued to read his lectures for more than twenty years, during which he gradually rose to the head of his profession. In 1723 he published a Treatise on the High Operation for the Stone. Cheselden, who was a very dexterous and successful operator, afterwards added to his reputation by practising what is termed the *lateral* method of operating for the stone, since generally adopted. A peculiar operation, which he performed on a youth of fourteen, who had been blind from his birth, and who obtained his sight by means of it, attracted much notice; and in 1728 he published an account of it in the Philosophical Transactions. In 1733 was published his Osteography, or Anatomy of the Bones, folio, consisting of plates and short explanations, a splendid and accurate work. Cheselden obtained in 1737 the appointment of chief surgeon to Chelsea Hospital. This situation he held till his death, which took place at Bath, April 10, 1752, in consequence of a fit of apoplexy. Besides the productions already mentioned, he published a translation from the French of Le Dran's Surgery, and several anatomical and surgical papers in the Philosophical Transactions. The private character of Cheselden was generally respectable; but he was not exempt from faults and foibles. Among these was a predilection for pugilism, and a degree of vanity which rendered him more ambitious of being thought a skilful architect or coach-maker than a good anatomist. He was, however, humane and liberal, and was much esteemed by Pope and other literary men with whom he was acquainted.

CHESS is a game of great antiquity and of the highest rank as a game of skill. It is strictly a scientific game, and, strange as it may seem to say so, it is really more difficult than many sciences. Sir Walter Scott is said to have objected to learn chess because the time it would occupy would be sufficient to learn two languages. Had he said seven he would have been nearer the mark; but if Sir William Hamilton is right, that the highest value of every study is in the mental discipline it confers, chess will hold a high rank as an intellectual pursuit. It may be defined as an endless succession of mathematical problems for impromptu solution. The origin of chess has been much debated, and to little profit. Many games played with pieces of various kinds on square checkered boards must inevitably have originated in different quarters of the globe independently of each other. The Chinese and the Indian game, both of great antiquity, are distinctly different developments, though probably of one original. The one has two players, the other four; the former is played on a board of 72 squares, the latter of 64, and in the Chinese game the board is supposed to be crossed by a river. The Indian game, called *Chaturanga* in Sanskrit, is probably the original of the European game; but its mythical history we leave to the antiquarians, who on this, as other subjects, have shown how thin are the partitions which separate between learned gravity and mad burlesque. One finds chess in 2 Sam. ii. 13–16, another in Horace, Ode I. 4, where 'Pallida mors æquo pulsat pede pauperum tabernas, regumque turres,' evidently means the white queen (called mors from her deadly power) can capture either the king's rook or a miserable pawn. The learned discoverer regrets that the poet has not mentioned the position to which he refers. An annotator of Shakspeare is more fortunate. When Miranda says in the Tempest, act v. sc. 1, 'Sweet lord, you play me false,' he gives an accurate description of the state of the game, and makes Ferdinand reply, 'True, my attack is strong, but play you false I would not for the world.' We refer those who wish to see the subject more seriously treated to Dr. Duncan Forbes' History of Chess (London, 1860), the most learned repertory of ancient chess lore extant. Whatever may be the origin of the game, it is of more importance to know that it is now as nearly perfect as anything of human contrivance can be. Chess, in fact, needs no recommendation but to be better known, and in this belief we proceed to lay before our readers a brief exposition of its elements.

Board.—The chess-board consists of sixty-four squares arranged in eight rows of eight squares each, alternately black and white. In chess all the squares of the board are used, and not, as in draughts, one colour only. It is immaterial what the colours of the board or men actually are; but for convenience the alternate squares, as well as the men constituting the forces of the opposing players, are always spoken of as black and white respectively.

Men.—Man is the generic term for the forces of all grades employed in chess. Each player has sixteen men. They are divided into two classes, pieces and pawns. Each player has eight of each class. The pawns are the lowest grade of men; the pieces are officers of various grades. They are, on each side, king and queen; two bishops, two knights, and two rooks or castles.

Setting the Board.—The board must be placed so that each player shall have a white square to his right hand. The men are then set upon the two rows of squares next the players; the pieces on the first, the pawns on the second row, leaving between them four unoccupied rows, or two between each player and the middle of the board. The pieces are not placed indiscriminately on the first row. The king and queen occupy the central squares facing the corresponding pieces on the opposite side. The queen always occupies her own colour, white queen on white square, black on black. One player (white) has thus his king on the side of the board toward his right hand, the other (black) on the side towards his left. The two bishops occupy the squares next the king and queen; the two knights the squares next the bishops; the rooks the last or corner squares. The pawns fill indiscriminately the squares of the second or front row.

Notation.—It will facilitate the description of the moves of the men to begin by describing chess notation. Unfortunately no notation has yet been invented calculated to secure the adhesion of the players of different countries. On the Continent various systems of algebraical notation are in vogue, which are all somewhat abstruse. We have only space to describe the English system, which, though not the briefest, is the most natural and the most easily learned. It is based first of all on a distinction which is universally recognized. The men standing on the king's or queen's side of the board are named respectively king's and queen's men. Thus White's right and Black's left hand bishop, knight, and rook are called king's bishop, king's knight, and king's rook; the pieces on the other hand are named in like manner from the queen. The pawns are named from the pieces in front of which they stand; king's pawn, king's knight's pawn, queen's rook's pawn, &c. The names of the men are contracted as follows:—King, K.; King's Bishop, K.B.; King's Knight, K.Kt; King's Rook, K.R.; Queen, Q.; Queen's Bishop, Q.B.; Queen's Knight, Q. Kt; Queen's Rook, Q.R. The pawns are contracted, K.P., Q.P., K.B.P., Q.Kt P., &c. The English notation differs from the algebraic notations in being a double one. The sixty-four squares of the board being comprised in eight rows of eight squares each, each square may be distinguished as occupying a particular position on a particular row. The board is thus divided, inversely from the position of each player, into eight rows and eight files. Counting from White's right hand to his left, or from Black's left to his right, each file is named from the piece which occupies its first square, and counting inversely from the position of each player to that of the other, the rows are numbered from 1 to 8. At White's right-hand corner we have thus K.R. square; immediately above this K.R. 2; and so on to K.R. 8, which completes the file; the second file begins with K.Kt square on the first row, and ends with K.Kt 8 on the eighth. White's K.R. 8 and K.Kt 8 are thus Black's K.R. square and K.Kt square, and the moves of each player are described throughout from his own position, and in inverse order to the moves of his opponent.

Moves of the Men.—The ordinary move of the P. is straight forward in the same file. The first time a P. is moved it may be played forward one square or two (from K. 2 to K. 3 or K. 4); afterwards it can only be played one square at a time (K. 4 to 5, 5 to 6, &c.) The capturing move of the P. differs from its ordinary move. In chess all the men capture by occupying the position of the captured man, which is removed from the board. Pawns never move backward, and, as pawns on the same file cannot capture each other, their advance would result in a dead block, but for the capturing move, which is diagonal. This will be made perfectly clear by an example. If White opens a game by playing P.K. 4, and Black answers P.K. 4, these pawns are immovable; but if White now plays P. K.B. 4, or P. Q. 4 (both well-known openings), Black may capture the P. last advanced. A piece occupying the same position would likewise be liable to be captured by the P. Pawns have another mode of capture peculiar to themselves, and only available against pawns. If Black's P., instead of occupying K. 4 stood on K. 5, and White played P. Q. 4, Black could not capture it by placing his P. on the square it occupies, which would be a false move; but he is at liberty to make the capture by placing his own P. on the square passed over by White's (Q. 6). This is called taking *en passant.* When a P. by moving or capturing reaches the eighth square of any file it can no longer remain a P., but must at once be exchanged for a piece. The player has the option of exchanging it for any piece he chooses except the king, and this privilege is not limited to pieces previously captured. If a player could advance all his pawns to the last row without losing his Q. he might have nine queens on the board; but chess is much too deadly a game for so utopian a consummation. Advancing a P. to the eighth row is called *queening a P.*, and the P. with which a player tries to accomplish this is said to be *going to queen.* When a P. is so placed that no P. can capture it on its way to queen, it is called *a passed P.* The moves of the pieces are not, like those of the pawns, limited to a single direction. The R. moves in any direction along the particular row or file on which it happens to stand. Its movements are thus always parallel to two of the four sides of the board. There is no limit to the distance it can traverse in a single move, except that it cannot pass over any other man in its course. If the obstructing man is a hostile one, however, it can capture it and occupy its place. If the P.s are removed White's K.R. can capture Black's on its own square. A R. situated on K. 4 can move to, or capture at, K. sq., K. 8, K.R. 4, Q.R. 4, or any intermediate square. The B.s, like the R.s, are unlimited in range, and move either backward or forward, but their direction is diagonal. One B. on each side is placed at first on a white square, the other on a black, and they can never change colour. A B. posted at Q. 4 can move to, or capture at, Q.R. sq., K.Kt sq., Q.R. 7, K.R. 8, or any intermediate square. The Q. combines the moves of the R. and B. She is the most powerful piece on the board, and can move to, or capture at, any distance or direction in a straight line. The K. is at once the weakest and the most valuable piece on the board. In point of direction he is as free as the queen, but for distance he is limited to the adjacent squares. Standing on any central square he commands the eight squares around him and no more; on a side square his range is still more limited. Besides his ordinary move the K. has another by special privilege, in which the R. participates. Once in the game, if the squares between K. and R. are clear, if neither K. nor R. has moved, if K. is not attacked by any hostile man, and if no hostile man commands the square over which K. has to pass, K. may move two squares towards either K.R. or Q.R., and R. in the same move must occupy the square over which K. has passed. This is called *castling*, and is notated castles (K.R.) or (Q.R.), according to the side to which the K. moves. The Kt, unlike the other pieces, never moves in a straight line. His move is limited to two squares at a time, and always obliquely. He has the advantage over all other pieces of being able to leap over any man occupying a square intermediate to that to which he intends to go. The Kt, like the K., when on a central square commands eight squares, but they are at two squares distance, and all in an oblique direction. From Q. 5, he commands Q.B. 3, Q.Kt 4, Q.Kt 6, Q.B. 7, K. 7, K.B. 6, K.B. 4, K. 3. As he approaches the side his range is more limited. From R. sq. he has only two outlets, B. 2 and Kt 3.

Captures.—Before concluding the description of the moves it may be observed that all captures in chess are optional.

Object and Laws of the Game.—Chess is not a mere struggle for the exhaustive capture of opposing forces. This is only one out of many ways in which its object can be accomplished. The definite aim is the reduction to surrender of the opposing king. This, which at first seems to narrow, in reality greatly widens its scope, by introducing whole schemes of tactics which would be utterly meaningless in a mere exhaustive struggle, while it by no means excludes the exhaustive method. The K. in chess is supposed to be inviolable, and in the operations for his reduction he can never be taken by surprise. Notice of every direct attack upon him must be given by the adversary saying *check*, and when the K. is attacked, or put *en prise*, all other plans must be abandoned, and all other men sacrificed, if necessary, to remove him from danger, cover the attack, or capture the assailant. It is also a fundamental rule of the game that the K. cannot be moved into check. When the K. can no longer be defended on being checked by the adversary, either by moving him out of danger or by interposing, or by capture, the game is lost, and the adversary announces this by saying *checkmate*. When by inadvertence, or want of skill, the player having the superior force blocks up his opponent's K., so that he cannot move without going into check, and no other man can be moved without exposing him, the player, reduced to this extremity, cannot, without violating the fundamental rule referred to, play at all. If, therefore, the K. is reduced to this position *without being actually in check*, the game has come to a dead-lock, the one player being unable to play, and the other out of turn. The game is consequently *drawn*, that is, concluded without advantage to either player. A game is also drawn when neither party has force to win, or ability to use a winning force effectively. The laws of the game embrace so many details, and are besides the subject of so much minute controversy, that we have not space to give an abstract here. Perhaps the best code is that given in Staunton's Chess Praxis, to which, without endorsing every point in it, we refer. The most important rule practically is that no man must be touched without being played—or captured, if it is an opponent's man. The penalty for infringing this rule is to be obliged to move the K., which must not be castled on a penal move. Inability to make the move contemplated does not exempt from the penalty, but inability to move the K. does. If a man is out of place the player incurs no penalty for adjusting it, provided he says *j'adoube* (I adjust), *before* touching it in order to do so. This latter rule, of which the strictest form is here given, is one of the burning points of controversy. The attention of the beginner at chess ought here to be called to the great importance of strict play, and to the absolute necessity of early acquiring the habit of invariably observing it. Nothing is more common, even among players of great pretensions, than to violate it, yet it has been well and justly observed that a game in which the strict rules are not observed is no more like a true game of chess, than a Hyde Park review is like the battle of Sobraon. However interesting your present scheme may be, and however silly the rash move by which you have just contrived to ruin it, resign the game at once rather than continue it in violation of the rules, or be content to forfeit all hope of ever being a player.

Hints on the Game.—To play chess well requires a combination of qualities much more desirable than easy of attainment. To play it ill is unsatisfactory to every one, and particularly so to yourself. The responsibility of representing the *genus irritabile*, which has usually been devolved upon poets, may by them be safely and honourably resigned in favour of chess-players. When it is considered that one out of two players, except in the comparatively rare case of draws, must always lose; that losing in chess is excusable only on the plea of admitted inferiority, and that the game is one of intellect, it will be seen that the constitution of human nature leaves ample scope for irritation, and even for worse vices among chess-players. The first advice to a player, therefore, is to be honourable, open, and manly in his play. These are qualities of which no superior skill can deprive him. Chess is a game of calculation, but the first error a learner is likely to commit is to mistake the place that calculation holds in it. However paradoxical it may seem to say so in regard to a game played on a limited board with a small number of pieces, it is certainly true that observation holds the first place, calculation the second; or rather that the first comprehends the second, and that to observe is to calculate. A player who wishes to be thought very profound may pride himself on being able to calculate ten or twelve moves deep, but it is clear that if at any point of his calculation he omits a possible move of a single P., the whole fabric of his vision is liable to tumble into ruin. On the other hand, as a player is permitted to renew his calculation at each move, if he could always make himself certain of the soundness of only a single move at a time, he would be a perfect player. Breadth in chess calculation is the only sure way to depth. As all the forces in chess can co-operate to a common end, the strength of a superior player depends on two things —power of combination, and rapidity of movement. It is evident that the strength of pieces having such wide ranges as the superior pieces in chess must greatly depend upon the freedom with which they are handled, and that even supposing equal powers of combination in other respects, a player might very easily double or treble his force by mere superiority in availing himself of the vast motive power of his forces. It is this which enables skilful players to give such heavy odds to their inferiors. Chess, from this consideration, is especially a game of time. Position is of even greater value in it than force. Command of the board is the first thing to be aimed at. To secure these advantages the player must, first of all, learn to bring his men rapidly into action. This implies developing your whole force, so that your men shall support each other as much as possible, and interfere as little as possible with each others' liberty of action. To remove your king as far as possible from danger, and from interfering with the aggressive movements of your men; to press on as many points of your opponent's position as possible, ready to pierce it wherever a change of position develops a weak point, but always watching the opportunity to make the whole attack converge upon the K., are also essential points in chess tactics. Another important observation is, that chess is not a game that can be mastered by *a priori* reasoning. It would be easy to prove this as a matter of theory. Chess is as nearly as possible a perfectly logical game, or a pure mathematical problem, without being entirely so. Every man has its defined mode of movement, and the combinations of the game result entirely from the combination of these separate movements. The object of the game, too, is perfectly simple and logical. There is thus more than enough to make the theorists imagine they have it all their own way; while, on the other hand, there is just enough to prevent them from having their own way. There are in the theory of the game certain slight irregularities, such as the different modes of moving and taking of the pawns, their optional power of moving one or two squares on the first move, the power of taking *en passant*, and the K.'s move of castling, which so far disturb the equilibrium of the game as to make *the openings* quite as much of a practical as of a theoretical science, and to render it difficult, or all but impossible, to determine whether there is a perfect equilibrium between the two sides, or a slight balance of advantage for or against the first player. This problem of the openings gives rise to a *politics* of chess, which proves, quite as much as the politics of the world, a maelstrom of excitement to those who are absorbed in it. Chess has been compared to war, and on the whole not unfairly. It must be understood, however, that a game of chess resembles a campaign rather than a battle. The comparison has been objected to on a very insufficient ground, namely, that certain great generals have tried chess, and have not excelled in it. The fact is undoubted, and tells directly against the argument of those who cite it. If a great chess-player were to undertake the command of a modern army, he would find that he wanted some experience which he could not well do without. In like manner, modern chess is a science which has profited by the experience of many generations of able tacticians; and a novice in the profession, whatever his experience may be in other lines, can hardly expect to be a master in it. But there is another thing to which chess has a greater resemblance than war, human life. In the aspects of the game on which we have been insisting, there are the same elements of apparent order, and the same minute, incalculable disturbance, which render the problem of life so hard to solve, so simple to him who sets out in it in the confidence of sound principles, so perplexing to him who finds experience continually thwarting the deductions of reason, and who is, perhaps, reduced at last to a sort of hand-to-mouth philosophy, in which his look ahead is more for the safe than the brilliant career.

In this mixture of the practical with the logical, chess presents scope for all kinds of capacities. A few simple directions, such as we have here given, together with twenty years' practice, will make any man of average capacity a fair chess-player. To excel in the game, as in anything else, requires a special genius for it.

In chess, as has been well observed, there are three things: a beginning, a middle, and an end. These are markedly distinguished from each other. The beginning of the game has already been referred to. It may be said to be the special ground of the politicians. The middle of the game is the part in which originality of invention, power of combination, and general mastery of chess tactics are most freely developed. The end-game, again, is distinguished by the exactness of scientific research. Here, from the comparative fewness of the pieces, results may be calculated with precision; but no one except those who have made such calculations can imagine the labour they involve. The few enthusiasts who imagine that draughts may be compared to chess, would do well to attempt the analysis of a few positions in this part of the game which most resembles their own. One peculiarity of the end-games in chess may be noted for the sake of beginners. The king, which until the principal pieces are exchanged must commonly be kept in a place of safety, as remote as possible from the thick of the fight, now issues from his retreat and joins in the mêlée, adding a new element to the combinations, and an important force to the player who knows how to use him aright. When left alone with pawns the whole game depends on his play. *Problems* are simply fancy end-games. They constitute the poetry of chess, and have nothing to do with its science. We ought to add a few words on the relative value of the men, but space will permit of only a single hint. Value them inversely to their force. The Kt, which is the most limited of the pieces in range, should be brought early into action. His value depends on proximity to the enemy's quarters. There his oblique movements spread confusion among the superior officers, and try the discipline of the enemy's host. The pawns, which are the feeblest class of men, are the finest attacking force. They are the infantry of chess, and the best players are distinguished for the skill with which they employ them.

Bibliography.—Many players, from a strange misconception of the source of originality, despise books. No player at the present day can be independent of those who have gone before him. The choice is between acquiring a knowledge of the stores of theoretical instruction accumulated from past experience in the easiest and pleasantest way from books, and acquiring it less perfectly from other players. If a player has any original capacity for chess, no acquired information will take it away; if he has no such capacity, no amount of ignorance will give it him. Chess bibliography is very ample, and is continually increasing. The most useful books, however, for learners of all kinds, are those of Staunton, particularly the Hand-book and the Praxis. Horwitz and Kling's End-games may be studied with advantage. Morphy's games, which are contained in the Praxis, and also published separately, with annotations by

Löwenthal, are of value chiefly to the most advanced players.

CHEST. See Thorax.

CHESTER, or Cheshire, a county of England, bounded by the counties of Lancaster, York, Derby, Stafford, Salop, Denbigh, Flint, the estuaries of the Dee and Mersey, and the Irish Sea. The area is 705,493 acres, of which about 540,000 acres are under tillage and permanent pasture. The surface is generally level, though there are a few inequalities, the most considerable being some hills on the eastern border and a ridge 18 miles long on the west. The soil is generally clayey or sandy, and the county contains some of the finest pasture-land in England, though there are also extensive tracts of moss and waste land. Sheets of water called *meres* are numerous. The dairy is the principal object of attention with the Cheshire farmer, and this county has for ages been celebrated for its cheese. There are also extensive tracts of land cultivated as market gardens, the produce being sent to Liverpool, Manchester, and other towns. Minerals abound in the county, especially rock-salt and coal, which are extensively worked. The principal salt-works are at Winsford, Nantwich, Middlewich, and Northwich. The cotton manufacture is carried on at Stockport, Stalybridge, and other places in the north-east of the county; there are large railway works at Crewe; and silks, fringes and trimmings, hats, boots and shoes, are also manufactured. Ship-building is carried on at Birkenhead. Trade is facilitated by railways, Crewe being an important junction on the London and North Western line, and by the Bridgewater and other canals, including the Manchester Ship Canal, which is partly in the county. The rivers which intersect this county (the principal being the Weaver) for the most part direct their currents northward, and discharge themselves into the Mersey and the Dee, which skirt the county. For parliamentary representation Cheshire is (since 1885) divided into eight divisions, each returning one member to the House of Commons. The principal towns are Chester, the county town, Birkenhead, Macclesfield, Stockport, and Stalybridge. Pop. in 1881, 644,037; in 1891, 730,058; in 1901, 814,555.

CHESTER (anciently *Deva*), county town of Cheshire, England, a cathedral city, parliamentary and municipal borough, seaport, and county in itself, situated on the Dee, about 20 miles from the Irish Sea, 16 miles from Liverpool, and 40 from Manchester. The city is square, and surrounded by a wall nearly 2 miles in circumference, forming a delightful promenade. The four principal streets meet at right angles, and have the roadways sunk considerably below the level of the footways, which run within piazzas covered by the upper portion of the houses, and in front of the ranges of shops. Flights of steps at convenient distances connect the carriage-ways with the footways or 'rows'. There are also shops and warehouses below the 'rows'. The cathedral is a large edifice of red sandstone, dating from the eleventh century, and exhibiting the various styles of architecture from the Norman downward. It was restored under Sir G. G. Scott at a cost of over £80,000. Some of the other places of worship are also noteworthy buildings. Among the educational institutions are the King's School (founded 1541), Diocesan Training College, and Queen's School (for girls). There are some fine old timber-framed houses, and an old bridge of seven arches crossing the Dee. The castle is a noble modern structure, built on the site of the old castle, and contains the county courts and jail. Amongst other public structures are the fine stone Grosvenor Bridge across the Dee, consisting of a single arch of 200 feet span; the Gothic town-hall (1869); the diocesan training college, of Tudor architecture, erected in 1842; the general post-office, the free library, savings-bank, corn-exchange, infirmary, music-hall, market-hall, the electric light station, and the large railway-station in the Italian style. There are a cemetery and three public parks. The principal manufactures are boots and shoes, paint, shot, lead pipes, whips, thread, and tobacco. The port and its access have been improved of late years, but the shifting navigation of the Dee will never allow it to become of leading consequence. Chester returns one member to parliament. Pop. (mun. bor.) in 1901, 36,281; (parl. bor.) 46,204.

CHESTERFIELD, a town of England, in Derbyshire, on the Midland Railway, 24 miles N. Derby. It has a large market-place and five principal streets, and is irregularly but substantially built, containing among its public buildings a handsome parish church in the Gothic style, with a remarkable crooked wooden spire 250 feet high, two other Gothic churches, a commodious town-house, guildhall, grammar-school, the Stephenson Memorial Hall, the Chesterfield Institute, &c. The principal manufactures are ginghams, lace, earthenware, leather, &c., but a majority of the working-classes are employed in connection with the collieries, iron-mines, quarries, and blast-furnaces of the vicinity. There are also iron-foundries, corn-mills, and engine-works. Mrs. Radcliffe, the celebrated romance-writer, was born at Chesterfield, and a branch of the Stanhope family takes the title of earl from it. Pop. (1891), 22,009; (1901), 27,185.

CHESTERFIELD, Philip Dormer Stanhope, Earl of, statesman, orator, and author, was born in London on September 22, 1694, and studied at Trinity Hall, Cambridge. In 1714–15 he made a tour through Europe, and on the accession of George I. General Stanhope, his great-uncle, procured him the place of gentleman of the bed-chamber to the Prince of Wales; and the borough of St. German, in Cornwall, elected him to Parliament, though he had not yet attained the legal age. He soon acquired distinction as a speaker, which he maintained also in the Upper House after his father's death in 1726. In 1728 he was appointed ambassador to Holland, and succeeded in delivering Hanover from the calamities of the war by which it was threatened. He was afterwards, in 1744, appointed Lord-lieutenant of Ireland, and on his return in 1746 received the place of secretary of state; but in 1748 he retired from public affairs, and devoted the remainder of his life almost entirely to study and the society of his friends. His talents as an author were displayed in several moral, critical, and humorous essays, in his parliamentary speeches, which were printed at a later period, and particularly in a collection of letters to his son, which have become famous. To the charms of wit and grace he united good sense, a thorough knowledge of the manners, customs, and the political condition of Europe, and a polished style. The moral tone of his letters, however, is very low. One is shocked to hear a father recommending to his son grace of manners as the most essential quality for a man of the world, and even instigating him to licentious irregularities. Another series of letters addressed to his godson, and published in 1889, have the effect of showing Chesterfield in a more favourable light. Towards the close of his life he suffered from deafness and other bodily infirmities, which cast a gloom over his last days. He was intimate with Pope, Swift, Bolingbroke, and other distinguished writers, and was acquainted with Dr.

Johnson, who called him a wit among lords, and a lord among wits, and said of his letters that they taught the morals of a prostitute and the manners of a dancing-master. He died March 24, 1773.

CHESTNUT, or **Spanish Chestnut** (*Castanea vesca*, natural order Cupuliferæ), a stately tree, having spear-shaped and pointed leaves, with tapering serratures at the edge. The flowers appear in long hanging spikes or clusters about the month of May; and the fruit, which is ripe in September, is enveloped in a husk defended by a great number of complicated prickles. The tree has long been grown in Britain, though not indigenous. Notwithstanding the known durability of the oak, there does not appear any well-authenticated instance of the age of an oak being equal to that of the celebrated chestnut-tree at Tortworth, in Gloucestershire, which was known as a boundary mark in the reign of King John. This tree is supposed to have been then more than 500 years old, making its present age about 1200 years. The diameter of its trunk is 15 feet, and it still continues to bear fruit. Few forest trees are more beautiful than the chestnut. It is true that the generality of painters prefer the oak for its picturesque form; yet in the landscapes of Salvator Rosa and other celebrated masters, chestnut-trees are very conspicuous. The nuts are a staple article of food to the agricultural classes in Spain and elsewhere. The timber of this tree was formerly much in use. It was frequently used for the beams and rafters of houses. For the heads and staves of casks, the wood of the chestnut is considered peculiarly excellent; and pipes made of it for the conveyance of water underground are said to be more durable than those made of either elm or oak. For furniture it may be stained so as somewhat to resemble mahogany. Hop-poles and poles for espaliers and dead fences, made of young chestnut-trees, are preferred to most others.

CHESTNUT, Horse. See Horse-chestnut.

CHEVAL, À (French), on horseback, astride any object. In a military sense, a body of troops is said to be *à cheval* of a river, if one wing is stationed on the right and the other on the left bank.

CHEVAUX DE FRISE (*Friesland horses*, so called because first used at the siege of Groningen, in that province, in 1658), armed beams of square timber or iron used to defend the fronts of camps, breaches, &c. They are usually from 15 to 18 feet long, and connected by chains, each being perforated with small holes to receive rods of wood or iron, pointed at their extremities, and when moved in any direction affording a sort of hedge of spears.

CHEVIOT HILLS, a range on the borders of England and Scotland, stretching S.W. to N.E. for above 35 miles. Their culminating point, known specially as the Cheviot, has a height of 2676 feet; Carter Fell, the next in height, is a little more than 2000 feet high. They are clothed for the most part with a close green sward, and are pastured by a celebrated breed of sheep admirably adapted for hilly districts, and known in many of the more elevated districts of Great Britain. See next article.

CHEVIOT SHEEP, or **Cheviots**, a breed of sheep of large carcass and valuable fleece, which has been pastured from time immemorial on the Cheviot Hills on the borders of England and Scotland, and from its hardiness, inferior only to that of the black-faced heath breed, is justly regarded as the most valuable mountain sheep of Great Britain. The peculiar features of the Cheviots are the absence of horns in both sexes, white, though occasionally mottled-gray face and legs, an erect, long, and clean head, destitute of wool, while both the throat and neck are well covered, a lively prominent eye, long open ears well covered with hair, and altogether a fine open sprightly countenance, with every indication of hardiness. The fleece weighs from 3 to 4 lbs., and the weight of the carcass varies in ewes from 12 to 16, and in wethers from 16 to 20 lbs. per quarter. The Cheviots, though originally confined to a small area, are now spread over all parts of the kingdom, and except on the most barren and stony grazings, are far more profitable than the heath breed.

CHEVREUL, Michel-Eugène, a French chemist, born at Angers in 1786, died 1889. He was educated in his native town, and when a youth he went to Paris, and was employed in the chemical factory of Vauquelin. In 1813 he became professor of physical science in the Charlemagne Lyceum; in 1824 he was made director of dyeing in the carpet manufactory of the Gobelins; and in 1830 succeeded Vauquelin in the chair of chemistry at the Museum of Natural History. He was the author of various treatises on chemistry and dyeing, and an important work on the Principles of Harmony and Contrast of Colours, which has been translated into English. He was a Commander of the Legion of Honour, and the centenary of his birth was celebrated in Paris with much enthusiasm.

CHEVRON. See Heraldry.

CHEVY CHASE, the name of a celebrated border ballad which is probably founded on some actual encounter which took place between Percy and Douglas, although the incidents mentioned in it are not historical. It is this ballad that Sir Philip Sydney speaks of when he says, in his Defence of Poetry, 'I never heard the old song of Percie and Douglas that I found not my heart moved more than with a trumpet'; and which is made the subject of a critique by Addison in Nos. 70 and 74 of the Spectator. On account of the similarity of the incidents in this ballad to those of The Battle of Otterbourne, the two ballads have often been confounded; but the probability is that if any historical event is celebrated at all in the ballad of Chevy Chase, it is different from that celebrated in The Battle of Otterbourne, and that the similarity is to be explained by supposing that the incidents were borrowed.

There are two versions of the ballad bearing the name of Chevy Chase, an older one and a more modern one. The older version is sometimes called the Hunting of the Cheviot, which is its original title. It begins thus:—

'The Persè owt of Northombarlande,
And a vowe to God mayd he,
That he wolde hunte in the mountayns
Off Chyviat within dayes thre,
In the mauger of doughtè Dogles,
And all that ever with him be'.

Neither the exact age nor the name of the author of this version is known. From the fact that it is mentioned in the Complaynt of Scotland, written in 1548, where it is called the Huntis of the Chevot, it is clear that it was known in Scotland before that time, and since James of Scotland is mentioned in the ballad, it may be inferred that it was not written before the reign of Henry VI., for James I. did not ascend the throne of Scotland till two years after Henry VI. had become King of England. As for the author, it is true that a manuscript of the ballad contained in the Ashmolean collection at Oxford is subscribed by one Rychard Sheale, but it is likely that this Rychard Sheale was merely one who had frequently recited the ballad, and perhaps the person who committed this old version to paper. This is probably the version with which Sir Philip Sydney was acquainted, since he speaks of it as 'evil apparelled in the dust and cobweb of an uncivil age'.

The age of the more modern version is no better known than that of the older one, but it is said by Dr. Rimbault to be no later than the reign of Charles II. This is the version which forms the subject of the critique by Addison in the above-mentioned numbers of the Spectator. The following is the opening stanza as given in Percy's Reliques:—

> 'God prosper long our noble king,
> Our lives and safetyes all;
> A woefull hunting once there did
> In Chevy-Chace befall.'

CHÉZY, Antoine Léonard de, one of the most distinguished pupils of the great orientalist, Silvestre de Sacy, began his studies in the École Polytechnique, and afterwards attended the lectures of Andran, Caussin, and Silvestre de Sacy, on oriental literature. Unassisted, he taught himself Sanskrit, and became such a proficient in it that, in 1814, a chair of Sanskrit was formed expressly for him in the College of France. He died of cholera in 1832. Among his productions is a free French translation of the Persian poem, Medjnun and Leila. He also published Kalidasa's drama of Sakuntala, in the original, with a translation accompanied with notes (Paris, 1830). His wife, the celebrated German authoress, Wilhelmine Christiane Chézy, born at Berlin in 1783, received an excellent education, and was married in her sixteenth year to a gentleman of the name of Hastfer, from whom she separated about a year after. Madame de Genlis, who had been acquainted with her at Berlin, invited her to Paris, where she shortly afterwards became the wife of Chézy, but separating from him as from her former husband, she returned to Germany and engaged in various literary pursuits. She has acquired considerable celebrity by her poems and novels, but is perhaps best known as the writer of the libretto of Weber's opera of Euryanthe. She died in 1856.

CHIABRERA, Gabriel Lo, a poet, born at Savona, in the Genoese territory, in 1552. Sound in mind and body, he lived to a great age, and died at Savona in 1637. His poetical genius developed itself late, and he was considerably advanced in years when he began to study the poets attentively. He preferred the Greeks, and particularly Pindar, his admiration for whom inspired him with the desire of imitating him. Thus he created a manner and style which was altogether different from that of the other Italian lyric poets, and which procured him the surname of the *Italian Pindar.* Equally successful were his attempts to imitate Anacreon; his canzonets are as easy and elegant as his canzoni are sublime. He is, besides, the author of several epic, dramatic, pastoral, and other poems. His fame soon spread over all Italy. He visited Rome, and resided a considerable time at Florence and Genoa. Wherever he went he was loaded with presents and honours. His Rime were published between 1586-88.

CHIANA (anciently *Clanis*), a river and valley, Italy, in Tuscany and Umbria. The river formerly flowed into the Paglia at Orvieto, after a course of about 56 miles through a swampy and unhealthy valley. About the middle of the twelfth century the stagnant waters of this river took their course towards the Arno; but, in consequence of important works begun in 1551, and completed only in 1823, the valley of the Chiana was drained, and the course of the river divided into two portions or distinct streams by a wall of partition, formed at Callone de Chiusi, 3½ miles S.E. Chiusi. The first, or Pontifical Chiana, comprises the lower part of ancient Chiana, and enters the Paglia by the left bank at Orvieto, after a course of 31 miles; it is navigable during winter. The second, or Tuscan Chiana, forms the navigable canal of Maestro della Chiana, which begins above the Lake of Chiusi, and enters the Arno by the left bank, 7½ miles N.W. Arezzo, after a course of about 37 miles. It forms the two small lakes of Chiusi and Montepulciano. The draining of the valley of Chiana has brought into cultivation about 36 square miles of the most fertile ground in Tuscany.

CHIAPAS, one of the states of the republic of Mexico, formerly belonging to Guatemala. It has an area of about 20,350 square miles, and a pop. (1894) of 269,710. It is in many parts mountainous, is intersected by several considerable streams, and covered with immense forests. In one of these, in the N.E., are the remains apparently of a large city, extending above 20 miles along a ridge. The valleys are fertile, and produce much maize, sugar, cacao, cotton, and cochineal. There is also a considerable export of logwood, and the horses of the country are highly valued. Rock-salt, soda, and sulphur are found. The industry of Chiapas is still in its infancy, furnishing scarcely a single article worthy of notice; and trade, though not unimportant, is unable to develop itself from the want of adequate means of transport. The capital of the state, formerly San Cristobal, is now Tuxtla; pop. 12,000.

CHIARI (ancient *Clarium*), a town, Italy, Lombardy, province, and 14 miles W. Brescia, and 6 miles E. the river Oglio. It is well built, has several churches, two convents, an elementary school, an hospital, and a public library. It was formerly fortified, and some of its ancient defences still exist. It has manufactures of silk, linen, and cotton, and some tanneries. Pop. 5297.

CHIARI, Pietro, a prolific writer of comedies and novels, born at Brescia about the beginning of the eighteenth century. After having completed his studies he entered the order of Jesuits, but soon changed the monastic for the secular life, and thus becoming free from all official duties, devoted himself solely to letters. He resided at Venice, with the title of poet to the Duke of Modena, and in the space of ten or twelve years brought more than sixty comedies on the stage. Chiari and Goldoni were rivals, but the public adjudged the palm to the latter. Chiari's dramas in verse fill ten volumes; those in prose, four. He is not destitute of invention nor of art in the management of his subjects, but his works are deficient in animation, vigour, and humour. He died at Brescia about 1787.

CHIAROSCURO (an Italian phrase, meaning *clear-obscure;* in French, *clair-obscur*), in painting, is the art of judiciously distributing the lights and shadows in a picture. A composition, however perfect in other respects, becomes a picture only by means of the chiaroscuro, which gives faithfulness to the representation, and therefore is of the highest importance for the painter; at the same time it is one of the most difficult branches of an artist's study, because of the want of precise rules for its execution. Every art has a point where rules fail, and genius only can direct. This point in the art of painting is the chiaroscuro. The drawing of a piece may be perfectly correct, the colouring may be brilliant and true, and yet the whole picture remain cold and hard. This we find often the case with the ancient painters before Raphael; and it is one of the great merits of this sublime artist, that he left his masters far behind him in chiaroscuro, though he is considered not so perfect in this branch as Correggio and Titian, who were inferior to him in many other respects. The mode in which the light and shade are distributed on any single object is easily shown by lines supposed to be drawn from the source of the light which is shed over the figure; but chiaroscuro comprehends, besides this, aerial perspective, and the proportional force of colours, by which objects are made to advance or recede from the eye, produce a mutual effect, and form a united and beautiful whole. Chiaroscuro requires great delicacy of conception and skill of execution; and excellence in this branch of art is to be attained only by the study of nature and of the best masters.—Chiaroscuro is also understood in another sense, paintings in chiaroscuro being such as are painted in light and shade and reflexes only, without any other colour than the local one of the object, as representations of sculpture in stone or marble. There are some fine pieces of this sort in the Vatican at Rome by Polidoro da Caravaggio, and on the ceiling of the Paris Bourse by Meynier and Abel de Pujol.

CHIAVARI, a seaport town, Italy, Piedmont, in the province of Genova (Genoa), at the mouth of the Sturla, on the Gulf of Rapallo, 23 miles E. by S. of Genoa, with 7000 inhabitants. It has all the appearance of an old Italian town, consisting of narrow streets lined with substantial houses and open arcades. Silks, lace, &c., are manufactured, and fishing is carried on, as well as commerce.

CHIAVENNA, a town, Italy, Lombardy, on the Mera, 38 miles N.N.W. Bergamo, in the province of Sondrio, with 3000 inhabitants. It stands in a valley in the midst of magnificent scenery on the road to the Splügen, and at the junction of two passes through the Alps, and has an important transit trade.

CHICA, the name of a red colouring matter which the Indians on the upper parts of the Orinoco and the Rio Negro prepare from the leaves of a plant native to that region called *Bignonia Chica*, and with which they paint their skin, in order to be better able to resist the rays of the sun. It is of a beautiful vermilion colour, and, although of a resinous nature, is not liable to become liquid under the influence of heat. It is soluble in alcohol, and stains cotton orange-yellow.

CHICA, the name of a kind of beer made from maize, which is in general use in Chile, Peru, and elsewhere in the mountainous regions of South America, and which was the national drink of the natives long before the appearance of the Spaniards in South America. The most ordinary method of preparing it is to steep the grains of maize until they begin to grow, when they are exposed to dry in the sun. The malt thus prepared is then ground, mixed with warm water, and left to ferment. The beer, when ready, has a dark-yellow colour, and a pleasant and somewhat bitter and sour taste. It is consumed by the Indians in great quantities. In the valleys of the north it is prepared by certain Indian tribes in a way which scarcely recommends itself so much to European tastes. By them the malt, instead of being ground, is chewed, and then mixed with warm water and some other things, and allowed to ferment as before. In a short time the beer is ready. When it has been buried for some time in the earth in pitchers it has a violently intoxicating effect. This kind of chica is called *chica mascada*, and is said to be much preferred by good judges to the ordinary sort. *Pito* and *poso* are other names given to chica.

CHICAGO, a city of the United States, in Illinois, situated on the south-west shore of Lake Michigan, and on both sides of Chicago River. It is about 21½ miles long by 10½ broad at its utmost extent, its area being fully 180 square miles; and it has a river frontage of 41 miles and a lake frontage of 21. The Chicago River and its two branches separate the main portion of the city into three unequal divisions, known as the North Side, South Side, and West side, which are connected by about 35 bridges and two tunnels. The site, which was at one time wet and swampy, has been artificially elevated about 8 or 10 feet. The streets are wide, and are laid out at right angles, and many of them adorned by rows of forest trees. Some of the finest streets in America are now to be seen in Chicago, and one of the features of the city is the enormous height of many of the buildings. There is an extensive series of parks, several of them on the lake shore, and many of them connected by wide and splendid boulevards. Jackson Park on the lake shore is the site of the great exhibition of 1893. Among the most noteworthy buildings are the new board of trade building, the court-house and city hall, the custom-house and post-office, the art institute, the Dearborn Observatory, the Auditorium, comprising a theatre and opera-house, a hotel, &c., many of the churches and business premises, &c. The public libraries are among the largest in the States, and in 1891 the educational system included over 200 schools, besides medical, theological, and other colleges, and the new and richly endowed Chicago University. To supply the city with abundance of good water a tunnel was constructed between 1864 and 1866, which extends for 2 miles under Lake Michigan, and another similar tunnel 4 miles long was finished in 1888. The sewage of the city is not allowed to enter the lake, but is conveyed inland by a partly artificial channel to the river Illinois, and thus to the Mississippi. The city derives its importance from its position on the great lake system of North America, and as the centre of a net-work of railways. Chicago is the largest pork-packing depôt, live stock, timber, and grain market in the world. The first ship that cast anchor at Chicago arrived in 1834. In 1896 the tonnage which entered was 6,481,115 tons, and 6,591,203 tons cleared. There is now direct communication by sea with Liverpool by way of Lakes Michigan, Huron, Erie, and Ontario, and the river St. Lawrence. The foreign exports are chiefly wheat, flour, Indian corn, meat, cheese. The foreign merchandise imported directly had a value of £2,941,750 in 1899. The granaries or elevators of Chicago are immense structures, being capable of containing 30,000,000 bushels of grain. The grain is raised to the higher stories by machinery. The Great Union Stock Yards for cattle, pigs, &c., cover 345 acres. The number of live hogs brought to Chicago in 1891 was 8,600,000, of cattle 3,250,000, of sheep 2,153,000. The chief industries include the packing and canning of pork and beef, the production of articles in iron, steel, brass, and other metals, of agricultural implements or other articles partly or wholly in wood, textile manufactories, tobacco and cigar works, chemical works, tanneries, printing and publishing, &c. Before 1831 Chicago was a mere trading-station. Its charter is dated March 4, 1837, its population then being 4170. The 'Queen of the Lakes' advanced with wonderful rapidity, and soon appeared destined to be the largest and most important commercial city west of New York. In 1871, however, a fire, unexampled in American annals, broke out on Oct. 8, and in thirty-six hours swept away 12,000 houses, including the entire northern and business sections of the city, and was only stopped in its progress southward by the blowing down of houses and a heavy fall of rain. By this calamity about 100,000 persons were rendered homeless and destitute, the loss of property being estimated at $200,000,000. But, thanks partly to the aid which streamed in from all quarters, partly to the energy of the inhabitants, and partly to its favourable situation, Chicago in a very short time recovered from this great disaster, and advanced with greater rapidity than before. According to the census returns the pop. in 1860 was 109,420; in 1870, 298,977; in 1880, 503,185; while in 1900 it was no less than 1,698,000. A very considerable proportion of the population consists of emigrants from Germany.

CHICHEN, or Chichen-Itza, an ancient ruined city of Yucatan, America, about 35 miles w. Valladolid. Its ruins are very magnificent, and have both a greater appearance of antiquity and are in better preservation than most of the other ruined cities of the same province, which has acquired so much interest from its remains of an unknown people in a higher state of civilization.

CHICHESTER, a municipal (and formerly a parl.) borough and episcopal city of England, near the south-west corner of the county of Sussex. It is well-built and has wide streets. Its old wall, still in good preservation and lined with lofty elms, gives it a very picturesque appearance. Its principal edifice is the cathedral, an ancient Gothic structure, with one of the most graceful spires in England, and containing among many monuments one of the poet Collins, who was born and died here The fine old octagonal market-cross should also be mentioned. The corn trade is extensive, and there are large cattle-markets. There is a harbour 2 miles distant, on an inlet of the English Channel. Chichester now gives name to a parl. div. Pop. in 1881, 8114; in 1891, 7842; in 1901 (boundaries extended), 12,241.

CHICKWEED (*Stellaria media*), an annual plant abounding everywhere in ill-cultivated or neglected places. It is botanically related to the corn-cockle or *Agrostemma*, belonging, like it, to the natural order of the Caryophyllaceæ. Among these the genus *Stellaria* is readily known—first, by its calyx, consisting of five separate sepals; secondly, by its petals being slit nearly to the base; and thirdly, by having ten stamens (five to seven of which are, however, rudimentary in the common chickweed), three stigmas, and a capsule which splits when ripe into six teeth or valves. Common chickweed differs from other wild species of the same genus in having prostrate stems, with a line of hairs passing down one side only, and ovate leaves.

CHICLANA, a town, Spain, Andalusia, 12 miles s.e. Cadiz. It stands in a plain on both sides of the Lirio, and about a mile n.e. of Barrosa, famous for the defeat of the French under Marshal Victor by the British under General Graham in 1811. It consists of well-built houses of hewn stone, white as snow, and generally inclosed by gardens. The principal buildings are a magnificent hospital, two parish churches, and a large and well-decorated theatre. The manufactures consist of linen, starch, earthenware, and other articles; and there is a considerable trade in corn, wine, and fruit. The baths of Chiclana, which have a temperature of 60°, and are said to be very efficacious in cutaneous affections, are much frequented. Pop. (1887), 12,348.

CHICORY (*Cichorium*), a genus of composite plants, including the two important species of *C. endivia* (endive) and *C. Intybus* (chicory or succory). The former, a native of the East Indies, has become a common garden plant, and though somewhat tender, is easily grown, and for household purposes in winter is most useful. It is known under two sorts—the *curled* and the *Batavian*, both forming well-known salads by the blanching of their leaves. The curled has beautifully crimped and curled leaves, which are tender and much esteemed; the Batavian has leaves which are nearly flat, and, being more hardy and better flavoured, is so much used, particularly by the French, who call it *scarolle*, that it forms the principal part of the winter salads used in Paris. The *C. Intybus* or *chicory*, a common perennial plant, has a deeply-furrowed, branched, and hairy stem, from 2 to 3 feet high, from the lower part of which milky leaves rise. The flowers are intensely blue, and generally grow in double heads. The leaves are sometimes blanched, to be used as salad, in the same way as *C. endivia*; and in their natural state are greedily devoured by cattle. But the most important part of the plant is its long, fleshy, and milky root, now extensively used, both on the Continent and in Great Britain, for mixing with coffee. For this purpose it is grown to some extent in Yorkshire, Lincolnshire, and Suffolk, and largely imported, particularly from Hamburg. In preparing the roots for use they are cut into small pieces, kiln-dried, roasted, and ground. When thus reduced to powder chicory strongly resembles coffee, but it is finer in the grain, lighter in the colour, and adheres more to the fingers. Its presence among coffee may easily be detected by putting a spoonful of the mixture into a glass of clear cold water, when the coffee will float on the surface, and the chicory separate and discolour the water as it subsides. The mixture of chicory with coffee has been recommended on the ground that it counteracts the astringent properties of the latter, deepens its colour, so as to give it more body, and improves its aroma. It is produced at a much cheaper rate than coffee, and ought to be sold at a much lower price. Various legal enactments have been passed in Britain with regard to the selling of coffee mixed with chicory, but by a treasury minute, issued 25th February, 1853, the mixture of chicory with coffee is permitted on the condition that each parcel sold bears a label entitled 'Mixture of Coffee and Chicory'.

CHIEF, in heraldry. See Heraldry.

CHIEF-JUSTICE OF ENGLAND, or more fully Lord Chief-justice of England, the presiding judge in the Queen's Bench division of the High Court of Justice, and, in the absence of the Lord Chancellor, president of the High Court, and also, *ex officio*, one of the judges of the Court of Appeal. See Supreme Court of Judicature.

CHIEF-JUSTICE of the COMMON PLEAS, previous to 1881 the presiding judge in the Common Pleas division of the High Court of Justice. The office is now merged in that of the Chief-justice of England.

CHIEM-SEE, a lake in south-east Bavaria, circle Isar, district Trostberg, 48 miles s.e. Munich; greatest length, 10 miles; greatest breadth, 9 miles; area, 74 square miles; depth, about 480 feet. It is of an irregular shape, very much indented, and contains three pretty islands—Krautinsel, Herrenwörth, and Frauenwörth. Each of the last two had at one time a convent. It discharges itself at its north extremity by the Alz.

CHIERI (ancient *Carea Polentia*), a town, Kingdom of Italy, on the side of a hill, in the province of Turin, 8 miles e.s.e. of the town of Turin, with 10,000 inhabitants. It is walled and well built, contains the largest Gothic church in Piedmont, with a very ancient baptistery; and at a very early period became celebrated for its manufactures of fustian, which are still flourishing. Here the Spaniards were defeated by the French in 1639.

CHIETI (ancient *Teate Marrucinorum*), a town, South Italy, capital of province of same name, on a hill near the right bank of the Pescara. It was anciently one of the largest and most important towns in this part of Italy, and was possessed for some centuries by Greeks, from whom it passed successively to the Romans, Lombards, Franks, and Normans. In 1802 it was taken by the French troops. The modern town, which is well built and adorned with several handsome edifices, is the see of an archbishop and the seat of a superior civil and criminal court, and has manufactures of woollens, and a trade in silk, wine, wheat, and oil. Pop. (1881), 12,273.

CHIGNON, a French word properly signifying the nape of the neck, now used in English and other languages as the designation of a mode of dressing the hair which has been at different times adopted by ladies, according to which the hair is collected into a ball behind, which rests upon the nape of the neck. This style was very common in the eighteenth century, and more recently the fashion was reintroduced at Paris, and spread into England, Germany, and elsewhere.

CHIHUAHUA, a state of the Republic of Mexico, bounded N. by the United States, N.E. by the Rio Grande del Norte, E. by Coahuila, S. by Durango, and W. by Cinaloa and Sonora; area, 83,746 square miles. It is traversed by the Sierra Madre, and its most important river is the Conchos, one of the affluents of the Rio Grande del Norte. Many of the valleys are very fruitful; vines and cotton flourish in many localities. The greater part of the state, however, consists of elevated plains, for the most part destitute of trees, but affording abundant pasture. The climate is very healthy, and the mineral wealth of the state is great. The silver-mines are particularly rich and abundant. The northern parts are occupied by the Apache Indians, who inhabit the districts adjacent to the Rio del Norte, and long carried on a series of ceaseless hostilities against the Chihuahuans. The trade is increasing, having been encouraged by the construction of the railway that enters the state from the north and runs south to the capital of the republic. Pop. (1894), 315,680.

CHIHUAHUA, a city of Mexico, capital of the state of same name, on a small tributary of the Conchos and on the railway to Mexico (see above), 310 miles N. by W. Durango. The houses are generally well built, and the streets regular. It contains a cathedral and an unfinished convent, begun by the Jesuits in 1767, prior to their expulsion from the country, and now converted into a state prison. The city is supplied with water by an aqueduct supported by a number of stupendous arches, and communicating with the small river Chihuahua, whence it empties itself into a large stone cistern in the public square. The city is surrounded by silver mines, and contains many furnaces for smelting the ores. Here also is a mint, which is always rented by some trading-house. Chihuahua is an important entrepôt for the trade passing between the trading towns on the Rio Grande and those on the Gulf of California. In the eighteenth century, when the yield of the silver mines was very large, the population is said to have been more than 60,000; the present population is about 25,000.

CHILAW, a town on the west coast of Ceylon, near the mouth of the Dederoo-oya 45 miles N. by W. Colombo. Its proximity to the pearl-fishery gave it an interest which it did not otherwise possess, and made it repeatedly the object of a keen contest. The Tamils wrested it from the Singhalese in the fourteenth century, and it afterwards passed successively to the Moors, the Portuguese, and the Dutch. From the last it was taken by the British in 1796. In the forest to the east of Chilaw, within a radius of 20 or 30 miles, are contained the ruins of a number of ancient cities. The road leading from Chilaw southward to Negombo passes through almost continuous cocoa-nut plantations. Pop. 5000.

CHILBLAINS are painful inflammatory swellings, of a deep purple or leaden colour, to which the fingers, toes, heels, and other extreme parts of the body are subject on being exposed to a severe degree of cold. The pain is not constant, but rather pungent and shooting at particular times, and an insupportable itching attends it. In some instances the skin remains entire, but in others it breaks and discharges a thin fluid. When the degree of cold has been very great, the parts affected are apt to mortify and slough off, leaving a foul ill-conditioned ulcer behind. Children and old people are more apt to be troubled with chilblains than persons of middle age, and such as are of a scrofulous habit are remarked to suffer severely from them.

CHILDBIRTH. See BIRTH.

CHILDEBERT, the name of three kings of the Merovingian dynasty, France. The first of this name was the third son of Clovis, and born about A.D. 495. On his father's death in 511 he succeeded to the kingdom of Paris as his share of the paternal dominions. His brother, Clodomir, king of Orleans, having fallen in an expedition against Sigismund, king of Burgundy, Childebert and his brother Clotaire, king of Soissons, determined to seize and divide his dominions, to the exclusion of the sons of Clodomir. The latter, mere boys—the eldest being only ten years of age—were then living under the care of their grandmother Clotilde, who cherished for them the utmost affection. Deceived by her two sons, Childebert and Clotaire, who represented that they intended placing them forthwith on the throne, Clotilde delivered up the two eldest boys to their uncles, by whom they were consigned to close custody. A messenger was thereupon despatched to Clotilde, bearing a sword and a pair of scissors, and demanding her choice whether her grandsons should have their hair cut and live, or be at once slaughtered. The wearing of long hair was then the exclusive privilege of royalty. Clotilde, indignant at the deception which had been practised on her, imprudently replied that she would rather see them dead than deprived of their kingly insignia. This answer being reported to the brothers, Clotaire seized his elder nephew and savagely stabbed him. The younger fell at Childebert's knees and begged for mercy, which the latter at first seemed willing to grant him, but urged by his brother's importunities, tossed the little supplicant over to Clotaire, who ruthlessly plunged his dagger in his side. A general massacre then ensued of the governors and servants of the young princes, and Childebert and Clotaire divided between themselves their dominions. A third son of Clodomir, Clodoald, escaped the fate of his brothers by the bravery of some faithful warriors, and secured his safety by becoming a priest. Such is the account of Childebert and his crimes given by Gregory of Tours. He and Clotaire did not long remain in harmony after their iniquitous procedure, and shortly afterwards broke out into a violent quarrel. Childebert thereupon laid waste the territories of Clotaire, and excited his son Chramme to rebel against his father. His own career, however, was now approaching its termination, and he died at Paris in 558. As he left no male issue, his dominions passed to Clotaire, who became thus sole king of the Franks.—The second and third kings of the Merovingian race, who bore the name of Childebert, belong to the latter part of the dynasty, the members of which, from their incapacity, received the appellation of *rois fainéants*, or *sluggard kings*.—CHILDEBERT II. was the son of Sigebert and Brunehaut, and born about 570. On the death of his father in 575, he was proclaimed king of Austrasia, and subsequently, by the death of his uncle Gontran, succeeded to the kingdoms of Burgundy, Orleans, and part of that of Paris. He died from the effects of poison in 596, leaving two sons, Thierry and Theodebert.—CHILDEBERT III., surnamed *the Just*, son of Thierry I., king of the Franks, was born about 683, and proclaimed king in 695, on the death of his brother, Clovis III. His kingship, however, was merely nominal, the true sovereign being Pepin le Gros or d'Héristal, who, under the title of Mayor of the Palace, exercised the real authority. Childebert died in 711, leaving a son, Dagobert, who succeeded him in the title of king.

CHILDERMAS DAY, a festival celebrated by the Church of Rome on the 28th of December, in commemoration of the massacre of the Innocents.

CHILI, or CHILE, a country of South America, bounded on the N. by Peru (till recently by Bolivia), E. the Andes, separating it from the Argentine Republic and Bolivia, W. and S. the Pacific Ocean; stretching from lat. 18° S. to 56° S.; and from lon. 68° to 70° W.; length, N. to S., 2600 miles; breadth, from 28 to 150 miles. Besides the long and narrow mainland, it includes the islands of Chiloé, Wellington, Santa Inez, &c. The area has been recently extended by accessions of territory. By a treaty with the Argentine Republic in 1881 Chili obtained possession of a small strip on the west coast of Patagonia and Magellan Straits, and the western part of Tierra del Fuego; and the Chilians have also annexed the seaboard of Bolivia and a part of Peru. It was officially estimated in 1893 that the total area then amounted to 293,970 sq. miles, and the pop. (including Indians) to 3,365,221. The chief towns are Santiago (the capital), and Valparaiso. The rivers are numerous, but small, and have generally rapid currents; the principal are the Biobio, the Copiapó, the Huasco, and the Chuapa, or Illapel. Chili presents a plain, rising in elevation as it recedes from the coast and approaches the Andes, by the numerous rivers flowing from which it is fertilized and beautified. The portion of it lying between the foot of the Andes and the Pacific Ocean is divided into two equal parts, the maritime and midland. The maritime part is intersected by three ridges of mountains, running parallel with the Andes, between which are numerous well-watered valleys. The midland country is generally level, of great fertility, and enjoying a delightful climate. In the great chain of the Andes some of the summits in Chili, or on its eastern frontier, rise to the height of more than 20,000 feet. In the Chilian part of the same chain there are many volcanoes, which are either still active or said to have been active within historical times. The climate of Chili is remarkably salubrious, and the weather generally serene. In the northern provinces it rarely rains—in some parts never—but dews are abundant; in the central part rain often continues three or four days in succession, followed by fifteen or twenty days of fair weather; in the southern provinces rains are much more abundant, and often continue nine or ten days without cessation. The hottest months in the year are January and February. Snow falls abundantly on the Andes, but is never seen on the coast. Earthquakes are common. Among the most disastrous that have taken place in recent times is that of Nov. 19, 1822, by which Valparaiso, Tuillota, Casa Blanca, and Limachi were destroyed. Another very violent one took place on the 20th of February, 1835, by which Concepcion and Talcahuano were destroyed.

Silver, copper, nitre, lead, and iron are found in Chili; but the last two, though abounding, are little sought after. Nitre, silver, and copper are the most important minerals. Nitre now forms the most valuable export of the country, and the nitrate fields have been largely developed by British capital. They are situated in the provinces formerly belonging to Bolivia and Peru. The copper mines are most numerous in the northern portion, especially in the province of Atacama. Zinc, antimony, manganese, arsenic, tin, sulphur, alum, and salt are also plentiful. Coal has been found in the province of Concepcion, and is wrought to some extent at Lota, Coronel, and Colchura. Though possessing many fertile tracts the greater portion of Chili is incapable of cultivation, being naked and mountainous, especially towards the N. The southern provinces present a different appearance. Here a profuse vegetation prevails; dense forests are spread over the land, and the sides of the Andes are covered with herbaceous plants and flowers of the richest and most beautiful hues. A characteristic forest tree is the araucaria. In some of the northern districts maize is cultivated, and potatoes also are grown in large quantities. In the southern districts wheat and barley are the chief agricultural products, and the former is a considerable article of export. Fruits are abundant in their season—apples, pears, apricots, nectarines, plums, peaches, cherries, figs, grapes, oranges, limes, water-melons, and gourds. Chili is remarkably free from the larger and fiercer animals, as also from noxious insects and reptiles. The animals common to the continent, however, are found here, including the guanaco, a species of the llama, the cougar or puma, the jaguar, monkeys, &c. The feathered race include the great condor, vultures, pelicans, parrots, and parroquets. Cattle are raised in great numbers, and from 4000 to 20,000 are sometimes kept on one farm. The horses are strong, hardy, and capable of performing long journeys with very little sustenance; and the mules and asses are also excellent. Sheep, goats, and hogs abound, but are of indifferent quality. The principal manufactures are earthenware, textile goods, cordage, soap, copper-wares, leather, brandy, sugar, &c. The commerce of the country has greatly increased in recent times. The total annual value of the exports to all countries, and of the imports from all countries, have averaged each from £10,000,000 to £14,000,000 in recent years. The chief exports are nitre, wheat, iodine, copper, and silver. Latterly the value of the nitre exported has been more than double that of all the other exports combined. By far the greater part of the foreign trade is with Great Britain, the principal articles of export to which are nitre, copper, wheat and barley, silver-ore, tin and tin-ore, and wool. Iodine, unrefined sugar, skins and furs, are also exported to Great Britain in considerable quantities. In the period 1894–98 the exports from Chili into the United Kingdom varied between £3,711,514 and £3,191,683 per annum. Cotton and woollen manufactures are the principal articles of British produce imported; others consist of coals, metals (especially iron), machinery, implements and tools, apparel and haberdashery. In 1894–98 the imports from Britain varied between £3,454,332 and £1,855,771. The chief ports are Valparaiso, Talcahuano, Iquique, Pisagua, Coquimbo, Antofagasta, Coronel, and Valdivia, all of which are open to trans-Atlantic trade. Chili possesses a small commercial navy of her own, the number of vessels being about 160, and the gross tonnage fully 80,000 tons. The total length of Chilian railways open for traffic is now about 2580 miles, of which 1200 miles belong to the state. The chief railways are those from Santiago to Curicó, from Santiago to Valparaiso, and from Talcahuano to Chillan. All the lines now constructing will also ultimately become the state property. The telegraph and telephone systems are fairly well developed.

Chili is a republic, and is considered the best regulated in South America. Its constitution dates from 1833. It is under a president elected for five years, and a council of state, together forming the executive power. The legislature is composed of a senate, consisting of thirty-two members, elected for six years; and a house of deputies, consisting of a member for each 30,000 inhabitants, elected for three years. Foreigners require ten years' residence to obtain citizenship, if unmarried; six years, if married; three years, if married to Chilian women. The council of state, which is appointed by the president, consists of the ministers, together with two judges, one ecclesiastical dignitary, one general or admiral, and five other members. The annual revenue usually amounts to between £6,000,000 and £7,000,000, and is generally in excess of the expenditure. The total debt, home and foreign, amounts to about £24,000,000, the foreign debt being over £17,000,000. The regular army (by the law of 1897) must not exceed 9000 men, including infantry, cavalry, and artillery. There is also the national guard, which numbers above 50,000 men. There is a small navy of modern type.

The Chilians are mostly of Spanish or Indian descent. They possess a considerable amount of energy and enterprise, and form an honourable exception to the indolence which generally characterizes the Spanish-Americans. Education is gratuitously provided by the state, and the extension of its benefits has been of late one of the constant aims of the government. Many primary, secondary, and special schools have been established. All the provinces possess lyceums that would not disgrace the large cities of Europe. There is a university in the capital. The Roman Catholic is the established religion of Chili, and the church is very rich. The members of other denominations are allowed full religious liberty.

The part of Chili lying s. of the river Biobio (in lat. 36° 44′ s.) is inhabited chiefly by Indians. The Araucanians, a warlike tribe inhabiting the region between the rivers Biobio and Valdivia, for many years maintained their independence, but at last, in 1882, they came to terms with the Chilian government, which now possesses the whole territory. To each family of Araucanians was left as much land as they could make use of. A line of forts here controls the passes of the Andes.

Chili originally belonged to the Incas of Peru, from whom it was wrested by Pizarro, who, in 1535, sent Almagro to invade the country, he himself having previously conquered Peru. Almagro carried all before him till he encountered the warlike tribes of the south, who arrested his progress. He was succeeded by Valdivia, who completed the subjugation of the country, with exception of Araucania. From this period Chili continued a colony of Spain till 1810, when a revolution commenced, which terminated in 1817 in the independence of the country. Several internal commotions have since occurred, particularly in 1850, when some violent proceedings took place on the part of the government opposition, but nothing very serious resulted from them. An attempted rising made in April 20, 1851, by Colonel Urriola in Santiago, was speedily suppressed by the president and ministers. A quarrel with Spain in 1864 led to the blockade of the coast by the Spanish fleet and the bombardment of Valparaiso in 1866, which was followed by that of Callao, the Peruvians having joined the Chilians. This was practically the end of the war, though hostilities were not formally closed till several years later. In 1879 a war broke out between Chili and Bolivia and Peru regarding the rights of Chili in the mineral district of Atacama, and after lasting several years ended in the success of Chili. In 1891 a civil war took place through the determination of President Balmaceda to act as dictator, but his overthrow and suicide put an end to this trouble. In 1898, on the failure of negotiations, the question of the boundary between Chili and the Argentine Republic was submitted to the arbitration of Great Britain.

CHILI SALTPETRE, or Cubic Nitre, is nitrate of sodium, which, however, is not really cubic, but crystallizes in very obtuse-angled rhombohedra. It is found in beds in the rainless district of Tarapaca, in Chili, where it occurs sometimes of great purity, but is generally mixed with other salts, one of which is iodate of sodium and with sand and clay. From the mines it is brought down by rail to the coast, and it is there transferred to ships, originally by means of rafts formed of inflated skins. The name of Chili saltpetre is a blunder. When the first cargo was brought to Liverpool, about 1830, its character was not known, and as it could not find a purchaser it was finally thrown overboard. The next cargo went to France, where its value was recognized, and ultimately quantities were brought to England. The demand for it has gone on steadily increasing, and large quantities have for years been imported into Great Britain. It is used either in mixed artificial manures or alone as a dressing for grass, the bulk of which it is said to increase. It was anticipated that it might be used for making gunpowder, but the deliquescence of the salt has been found an insurmountable difficulty. It is, however, transformed into nitre by double decomposition with chloride of potassium, and large quantities are imported into Stassfurt, in Germany, for this purpose. It is, besides, substituted, whenever practicable, for nitrate of potassium as a source of nitric acid. The sole drawback to its general use for this purpose is the presence of chlorides, which, giving off hydrochloric acid, render the nitric acid impure. Of late the industry at Tarapaca has been greatly developed. The crude salt is subjected to purification, iodine is obtained from the mother liquors, and railways have been laid to carry the products to the coast.

CHILLAN, a town of Chili, capital of the province Ñuble, in an angle between the Chillan and Ñuble, 180 miles s. by w. Santiago, with which it is connected by rail. It consists of an ancient and a modern portion, the former built by the Spanish conquerors, who made it a place of some strength, in which the early settlers often found an asylum when hard pressed by the Araucanians. The old town was founded in 1579, and destroyed by an earthquake in 1835. The new town was built shortly after the latter date. Pop. about 29,000.

CHILLIANWALLA, a village of the Punjab, about 5 miles from the left bank of the Jhelum, 85 miles north-west of Lahore, famous for a well-contested battle fought in its vicinity in 1849 between the British under Lord Gough and the Sikhs, in which the former, though they remained masters of the field, lost 2269 men. A second battle fought about six weeks after, at Gujerat, nearly annihilated the Sikh force.

CHILLICOTHE, a town of the United States, capital of Ross county, Ohio, on the west bank of the Scioto, 45 miles in a straight line, and 70 according to the windings, from its mouth. It is pleasantly situated on the borders of an elevated, extensive, and fertile plain, regularly laid out, the streets crossing each other at right angles, and is a flourishing town. In the vicinity of the town there are many mills. Pop. in 1890, 11,288.

CHILLINGWORTH, William, an eminent English divine and writer on controversial theology. He was born at Oxford in 1602, and received his education at Trinity College, in the university of that city. He did not confine his academical studies to divinity, but also distinguished himself as a mathematician, and cultivated poetry. Metaphysics and religious casuistry, however, appear to have been his favourite pursuits; and Lord Clarendon, who was particularly intimate with him, celebrates his rare talents as a disputant, and says he had 'contracted such an irresolution and habit of doubting that by degrees he grew confident of nothing'. This sceptical disposition laid him open to the arguments of a Jesuit, who persuaded him that the Church of Rome, in establishing the authority of the pope as an infallible judge, afforded the only means for ascertaining the true religion. He was convinced by this reasoning, and converted, but subsequently came to the conclusion that he had acted erroneously, and wrote several pieces to justify his second conversion, especially The Religion of Protestants a Safe Way to Salvation, first published in 1638. Some scruples of conscience relative to signing the thirty-nine articles prevented him for a time from obtaining church preferment. His scruples, however, were so far overcome that he made the subscription in the usual form, and was promoted to the chancellorship of Salisbury, with the prebend of Brixworth annexed, in July, 1638. On the civil war taking place Chillingworth joined the king's party, and employed his pen in a treatise, Of the Unlawfulness of Resisting the Lawful Prince, although most Impious, Tyrannical, and Idolatrous. This tract was not, however, committed to the press. He did not confine himself to literary efforts in support of the royal cause. He was present at the siege of Gloucester in 1643, and his classical reading suggested to him an imitation of some Roman machine for the attack of fortified places; but the approach of the parliamentary army prevented the trial of it against the walls of Gloucester. Not long after he retired to Arundel Castle in an ill state of health, and was made a prisoner on the surrender of that fortress to Sir William Waller. Being removed at his own request to Chichester, he died in the episcopal palace in January, 1644. Chillingworth published sermons and other theological works, of which the best edition is that of Dr. Birch, 1742, folio.

CHILLON, a castle, Switerzland, on the Lake of Geneva, 6½ miles S.E. of Vevay, once an important stronghold of the counts and dukes of Savoy, and the prison-house of Francis Bonivard, prior of St. Victor, Geneva, from 1530 to 1536. It stands on a rock rising 22 yards from the shore of the lake, and is reached by a bridge. It probably dates from the ninth century. Bonivard was confined in it by the Duke of Savoy because he had assisted the republic of Geneva, with which the duke was at enmity. Byron's poem, the Prisoner of Chillon, founded on this incident, has lent it an interest it would not otherwise have possessed.

CHILOÉ, a province and island in the Republic of Chili. The province comprehends the island of Chiloé, together with the small islands surrounding it, the Conchos Archipelago, the Guaytecas, or Huaytecas Archipelago, and that portion of the mainland lying to the south of the province of Llanquihué, as far as the colony of Magallanes. The island of Chiloé is the largest of the islands belonging to the province. It is for the most part covered with dense forests, but large tracts of it are still unexplored. In length it is about 120 miles, and its breadth varies from 15 to about 40 miles. The chief town is San Carlos, or Ancud, which lies on the northern coast at the western entrance of the Straits of Chacao. Its harbour is safe, and unites all the advantages which sailors can desire off the stormy coast of Chili. The exports consist chiefly of timber from the forests of the island and the mainland. The trees of which the forests are composed are chiefly a bastard cedar, of great durability, and well adapted for beams and rafters. The other more valuable trees are the avellana (*Quadra heterophylla*), the roble (*Fagus obliqua*), a kind of beech, &c. Oysters, which are very scarce elsewhere in South America, are found in plenty in the Chiloé Archipelago, and are exported in small quantities to Valparaiso. The potato is found growing wild in Chiloé and the adjacent islands, as well as elsewhere in Chili, but it is inferior in size and taste to the cultivated sorts. Area of the province (islands inclusive), 30,981 square miles; pop. according to official returns in 1895, 82,362.

CHILON, one of the so-called seven wise men of Greece. He flourished about the beginning of the sixth century B.C., and was a native of Sparta, and one of the Ephori, a body of magistrates which he is even said to have originally introduced. A collection of his sayings may be seen in Orelli's Opuscula Græcorum sententiosa (Leipzig, 1819).

CHILTERN HILLS, a range of flint and chalk hills, England, extending from Henley-upon-Thames, in Oxfordshire, to Tring, in Hertfordshire, passing through the centre of the county of Buckingham, where its loftiest summit attains a height of 905 feet above sea level. These hills were anciently covered with forests, and were infested by numerous bands of thieves. To protect the inhabitants of the neighbouring districts from the depredations of these banditti an officer was appointed by the crown, called the steward of the Chiltern Hundreds, and although the duties have long ceased the office still exists, and is made use of to afford members of the House of Commons an opportunity of resigning their seats when they desire it. Being a government appointment, though without either duties or emoluments, the acceptance of it disqualifies a member from retaining his seat.

CHIMBORAZO, a mountain of Ecuador, in the province of Quito, about 90 miles S. by W. Quito; lat. about 2° S. Though not the loftiest summit of the Andes, it rises to the height of 20,703 feet above the level of the sea, and is covered with perpetual snow 2600 feet from the summit and upwards. It presents a magnificent spectacle when seen from the shores of the Pacific Ocean after the long rains of winter, when the transparency of the air is suddenly increased, and its enormous circular summit is seen projected upon the deep azure-blue of the equatorial sky. The great rarity of the air, through which the tops of the Andes are seen, adds very much to the splendour of the snow, and aids the magical effect of its reflection. This mountain was ascended, in 1802, by Humboldt and Bonpland, who, though they failed to reach the summit, yet mounted to the great height of 19,390 feet above the sea—a greater elevation than ever was before attained by man. Their further ascent was prevented by a chasm 500 feet wide. The air was intensely cold and piercing, and owing to its extreme rarity blood oozed from their lips, eyes, and gums, and respiration was difficult. One of the party fainted, and all of them felt extreme weakness. In 1880 the summit was reached for the first time by Mr. E. Whymper.

CHIMERA, or CHIMÆRA, a fabulous monster, breathing flames, with the head of a lion, the body of a goat, and the tail of a dragon, which laid waste the fields of Lycia, and was at last destroyed by Bellerophon. (See HIPPONOÜS.) Her form is described by the poets as an unnatural mixture of the most incongruous parts. Therefore the name of *chimera* is used for a nondescript, an unnatural production of fancy. According to some Chimera was a volcano in Lycia, around the top of which dwelt lions, around the middle goats, and at the foot poisonous serpents. Bellerophon is said to have been the first who rendered this mountain habitable.

CHIMES, a species of music, mechanically produced by the strokes of hammers against a series of bells, tuned agreeably to a given musical scale. The hammers are lifted by levers acted upon by metallic pins, or wooden pegs, stuck into a large barrel, which is made to revolve by clock-work, and is so connected with the striking part of the clock-mechanism that it is set in motion by it at certain intervals of time, usually every hour, or every quarter of an hour. The music thus produced may consist of a direct succession of the notes constituting an octave, frequently

repeated, or it may be a psalm-tune or short popular air in the key to which the bells are tuned. This species of mechanical music most probably had its origin, like clock-work itself, in some of the monastic institutions of Germany, in the middle ages. The first apparatus for producing it is said to have been made at Alost, in the Netherlands, in 1487. The chime mechanism may be adapted to act with the large bells of a church steeple, by means of wheel-work strong enough to raise heavy hammers; or a set of bells, of different diameters, may be arranged concentrically within one another on one common axis, sufficiently small to be introduced into the frame of a clock, or even of a watch. The chime mechanism is sometimes so constructed that it may be played like a piano, but with the fist instead of the fingers. This is covered with leather, that the blow on the key may be applied more forcibly. Difficult as the performance is, some players can execute compositions consisting of three parts, and even produce trills and *arpeggios*. Burney relates that the chime-player Scheppen, at Louvain, laid a wager with an able performer on the violin that he would execute a difficult solo for the violin with the bells, and won his wager. Potthoff, organist and chime-player at Amsterdam, played his bells with the facility of a performer on the pianoforte, although every key in his apparatus required a force equal to a 2-lb. weight. Burney heard him perform some fugues in 1772. The finest *carillons* or sets of musical bells are to be found in Belgium, at Bruges, Ghent, Antwerp, Namur, and Mechlin. These consist of from forty to fifty bells, the largest weighing several tons, the smallest only a few pounds.

CHIMNEY. How far the Greek and Roman architects were acquainted with the construction of chimneys such as we have is a matter of dispute. That kitchens and baths were provided with chimneys appears certain, but how far other apartments were so provided is doubtful. An ancient mosaic found in Algeria, and representing a Roman country mansion, shows chimney-stacks projecting above the roof. Of course in southern Europe fires are less necessary than in northern Europe. (See Smith's Dict. of Antiquities, 1890-91.) Chimneys require much attention to make them secure and prevent their smoking, so great an annoyance to domestic comfort. It seems at present to be acknowledged that it is much better to exclude the cold, damp air from the flues, by narrowing the aperture at the top, than to give larger vent to the smoke at the risk of admitting a quantity of air to rush down the flue. For this reason chimney-pots are of great use. In Prussia, where the architectural police (*Baupolizei*) is strict, great attention is paid to the erection of chimneys, and to the regular sweeping of them, the chimney-sweepers being bound to sweep the chimneys of a certain number of streets within a regular time. The longer a chimney is the more perfect is its draught, because the tendency of the smoke to draw upwards is in proportion to the difference of weight between the column of air included in a chimney, and an equal column of external air; and the heated air in the chimney being lighter than the external air, the longer the chimney is the greater is this difference. Short chimneys are liable to smoke, and fireplaces in upper stories are therefore more apt to smoke than those in the lower ones. Two flues in the same chimney should not communicate with each other short of the top. In manufactories tall chimneys are built for the purpose of carrying away the great quantities of smoke, which would otherwise be highly deleterious to the health of those living in the neighbourhood. In chemical works especially these chimneys are sometimes built to an immense height. The principal chimney of the St. Rollox Chemical Works, at Glasgow, which rises to the height of 450 feet from the foundation, or 435 feet above the ground, and that of Townsend's Chemical Works, in the same city, which rises 468 feet from the foundation, or 454 feet above the ground, are the two highest structures of the kind yet erected. Such chimneys are now built from the inside, by which the expense of the scaffolding is saved.

CHIMPANZEE. See APE.

CHINA, or CHINESE EMPIRE, an immense territory, stretching from the centre to the eastern extremities of Asia, and occupying nearly a third of the surface of that continent; between lat. 18° 20′ and 56° N., and lon. 73° and 135° E.; bounded north by Siberia; west by Russian Turkestan, the Russian Pamir, Cashmere, &c.; south by India, Burma, Anam, and the China Sea; east by Siberia, Corea, and portions of the North Pacific Ocean, under the names of Tongay or Eastern Sea, and Whanghae or Yellow Sea; greatest length, west to east, about 3000 miles; greatest breadth, 2400 miles; area, about 4,300,000 square miles. This vast empire is usually divided into China Proper, which forms its nucleus, and the following dependencies:—Manchuria, Mongolia, Eastern Turkestan, Dzungaria, and Tibet, with numerous islands, the largest of which is Hainan. The authority which the Chinese exercise over their dependencies is by no means uniform. Some of the dependencies, as Manchuria, are so closely connected with the empire as almost to be incorporated into it, while others are merely tributary; and Tibet is so independent as to do little more than profess a nominal allegiance to the Emperor of China, as the suzerain of the country.

CHINA PROPER (anciently *Cathay*; Chinese, *Chung Kwoh*, 'Middle Kingdom') forms the south-eastern portion of the empire, and occupies less than a third of its whole extent. Not including the island of Hainan, it lies between lat. 20° 20′ and 41° N., and lon. 98° and 123° E. China is bounded, north by one of the most remarkable of human structures, the Great Wall, which proceeds directly over mountain and valley, and for a length of 1250 miles forms the barrier between China and Mongolia; on the west it is bounded by Tibet; on the south by Burma, Tonkin, and the China Sea; and on the east by the North Pacific Ocean. The provinces with their areas and population, according to the latest returns available, are as follows:—

NAME.	Area in sq m.	Population.	Capital.
Chihle (Pechili)	58,949	17,937,000	Peking.
Shan-tung	53,762	36,247,835	Tse-nan-foo.
Shansi	56,268	12,211,453	Tae-yuen-foo.
Honan	66,918	22,115,827	Kae-fung-foo.
Kiang-su	44,500	20,905,171	Nanking
Nganhwei	48,461	20,596,288	Ngan-king-foo.
Kiang-si	72,176	24,534,118	Nan-chang-foo.
Che-kiang	39,150	11,588,692	Hang-choo-foo.
Fokien	38,500	22,190,556	Foo-choo-foo.
Hoopeh	70,450	39,412,940	Wo-chang-foo.
Hoonan	74,320	21,002,604	Tchang-sha-foo.
Shen-si	67,400	8,432,198	Se-gan-foo.
Kansu	125,450	9,285,377	Lan-choo-foo.
Sechuen	166,800	67,712,897	Ching-too-foo.
Quang-tung	79,456	29,706,249	Canton.
Quang-si	78,250	5,151,327	Que-lin-foo.
Yunnan	107,969	11,721,576	Yunnan.
Quei-chow	64,554	7,669,181	Quei-yang-foo.
	1,312,328	400,474,413	

MANCHURIA (Chinese, *Tung-san-sheng*) comprises the extreme N.E. portion of the Chinese empire. It is bounded on the N. by the river Amur and Russian territory, E. by the Russian maritime province, W.

by Mongolia, and S. by the Gulf of Liao-tong and Corea. It is divided into the three provinces Mukden, Hei-lung-chiang, and Kirin, the respective capitals of which are Mukden, Tsitsihar, and Kirin. The total area is 280,000 square miles, the population, 21,000,000. MONGOLIA is the name given to the vast stretch of desert land which, interspersed with infrequent oases, stretches across the greater part of the north of China along the Siberian frontier. A large part of its area of 1,288,000 square miles is taken up by the Gobi desert. The population, which is almost entirely nomadic, is estimated at 2,000,000. The chief town is Urga. EASTERN or CHINESE TURKESTAN is a mountainous region lying between the western tract of the Gobi desert and the Pamirs, and enclosed N. and S. by the ranges of the Tian-shan and the highlands of Cashmere and Tibet. It possesses an area of 431,000 square miles, and its population is estimated at 600,000. The principal towns are Kashgar and Yarkand. DZUNGARIA or JUNGARIA, the smallest of the tributory states of China, lies to the N.W. of Turkestan, on the banks of the Ili river, at the junction of Mongolia, Turkestan, and the Russian province of Semipalatinsk. Its area covers 147,900 square miles, and its population is said to amount to half a million. TIBET comprises the mountainous region lying between Turkestan and Nepal and Assam. On the east it adjoins China proper, and on the west Cashmere. It covers an area of 651,500 square miles, and is supposed to contain a population of 6,000,000. Its capital is Lhassa.

Physical Features.—Owing to the exclusive policy of the Chinese and their dislike of foreigners, a great part of the interior of the country must be regarded as still almost a *terra incognita.* The coast-line, however, is now well known. Forming an irregular curve of about 2500 miles, it gives about 1 mile of coast for every 500 miles of area. It is not deeply penetrated by gulfs, the only one of great extent being that of Pechili in the north-east, but numerous indentations of sufficient dimensions to form safe and capacious roadsteads are found in every quarter. With exception of a bold and rocky peninsula in the province of Shan-tung, the shore from the Gulf of Pechili south to the island of Chusan is flat, and in many places so little raised above the sea-level as to be extensively inundated during a continuance of strong winds. From Chusan to the mouth of Canton river it is usually rocky, bold, and precipitous; from this point south-west, flats, occasionally interrupted by bold headlands, again prevail. A peninsula of some size juts out in the extreme south from Quang-tung province, separated from which by a narrow strait is the large island of Hainan. Chusan island and archipelago are also of importance, but most of the innumerable islands dotted round the Chinese coast are very small. The large island of Formosa, off the east coast, now belongs to Japan. Many lighthouses have been planted along the coast. Two-thirds of the interior are estimated to be mountainous. The general slope is from west to east, and the mountains are a continuation of those of Tibet and Central Asia. The great Kuen-lun range throws off branches, the Tsing-ling, Fu-niu-shan, and Mu-ling, which, running eastward between the great valleys of the Hoang-ho and Yang-tse-kiang, traverse almost the whole breadth of China. In Western Sechuen, which is occupied by continuations of the Tibetan mountains, there are peaks reaching the height of 25,000 feet. In the north the Nan-shan branch of the Kuen-lun range runs under various names (Kuliang, Alashan, Inshan, &c.) along the north-east of China till it reaches the frontier of Manchuria, north of Peking. A third great mountainous region of China is in the south-east, where extensive chains such as the Nan-shan, the Ta-yu-ling, the Pu-ling, the Shi-shan (16,000 feet), &c., stretch on the south of the Yang-tse-kiang all the way from the highlands of Yunnan to the eastern sea-board. Between the main mountain systems, and following courses which may be roughly described as parallel, run the two great rivers of China, the Hoang-ho and the Yang-tse-kiang. Here lie the central and richest Chinese provinces. On both sides of the lower Hoang-ho is an immense delta plain, consisting generally of a deep alluvial soil of unparalleled fertility. This great plain has a length of not less than 700 miles, and a width varying from 150 to 500 miles, and probably maintains a denser population than any other portion of the earth's surface of similar extent. The geology of China is very imperfectly known, but there is no doubt that all the leading geological formations are found in it. Primary formations are most largely developed in the mountainous regions of the west, where granite, gneiss, and primitive schists prevail. The same formations exist to a more limited extent in the south-east, where bleak mountains of granite give that district a distinguishing feature. The secondary formation, including the carboniferous and cretaceous system, occupies a considerable area, and the coal-fields of China are perhaps the most extensive in the world. The tertiary formation has its largest development in the north-east, and probably underlies the greater part of the alluvium which covers the surface of the Great Plain. A surface feature of a great part of northern China is the earthy deposit known as 'loess', which covers an immense area both of mountain and valley, forming a yellowish-brown soil of the utmost fertility.

Rivers and Lakes.—No country of the world is better watered than China. The Yang-tse-kiang, which traverses the country centrally west to east, has a course of some 3000 miles, and forms a splendid inland waterway up which ocean steamers can sail for 1100 miles to Ichang, a port opened to foreign trade. The Hoang-ho, farther north, and next in size, has a course of over 2600 miles, but is of much less value for commerce, being comparatively shallow, subject to tremendous and disastrous floods, and apt to shift its course. The Grand Canal connects the lower course of the Yang-tse with that of the Hoang-ho, starting from Hang-chow Bay in the south, and being continued to Tien-tsin in the north, thus completing what is said to be the most magnificent system of water communication in existence. This great waterway has, however, been greatly neglected, and threatens to become unusable unless the necessary repairs are taken in hand. Besides these rivers and their numerous tributaries, the most deserving of notice are the Si-kiang in the south, of considerable size but still more commercial importance, having at or near its embouchure Canton, Hong-Kong, and Macao; and the Pei-ho, which, though much smaller, forms a waterway between Peking and the Gulf of Pechili. The lakes of China, though rather numerous, are not individually of great extent. Perhaps the largest is Tung-ting, in the province of Honan, which furnishes an affluent to the Yang-tse-kiang, and has a circuit of 270 miles. Poyang, in the province of Kiang-si, is 90 miles long by 20 broad, abounds in fish, and is remarkable both for the picturesque scenery around it and the numerous beautiful and populous islands which it incloses.

Climate.—The greater part of China belongs to the temperate zone, only a small portion of the south lying within the tropics. It has what is called an excessive climate, and has a far greater range of temperature than is usual within the same parallels of latitude. Peking, the capital, is nearly a degree south of Naples, and yet while the mean temperature of the latter is 63°, that of the former is only 54°. In summer, however, the heat reaches from 90° to 100° in the shade, while the winter is so cold that the rivers usually continue frozen from December to March. At Hong-Kong, notwithstanding the influence of the sea in checking extremes, the thermometer in June and July, the hottest months, frequently stands at 90°, and in winter, from December to March, sinks nearly to the freezing-point. At Canton and the adjacent hills snow, though rarely, has sometimes fallen. At Shanghai, lat. 31° 20′, the range of temperature is still greater, the maximum reaching 100°, and the minimum falling at least 20° below freezing, or 12° Fahr. In the south the climate is of a tropical character, the summer heat rising to 120°. Here the south-west and north-east monsoons blow with great regularity, and nearly divide the year between them. In the north they are more variable. The violent hurricanes known as 'typhoons' are not uncommon in the Chinese seas.

Mineralogy.—China is well supplied with useful minerals. Gold, though not thought to be very abundant, is obtained by washing the sand of several of the rivers, particularly those of the upper branch of the Yang-tse, and in the mountainous and almost inaccessible regions of Yunnan. Silver is also found in the same regions. The quantity also must be considerable, since it suffices for a large annual export, chiefly in payment of opium and other goods. Copper, besides forming the ordinary currency in limited mercantile transactions, is worked to a great extent for economical purposes. Mercury or quicksilver, in the form of cinnabar, is of frequent occurrence, and is much used both for colouring and medicine. Its fumes, the poisonous nature of which is well known, are even said to be inhaled like opium or tobacco. There is no want of iron either in the form of rich hematite, or in that of the carbonate of the coal-measures, but smelting is not carried on to any considerable extent. Lead, tin, and zinc exist, but owing either to a deficiency in quantity, or ignorance of the method of extracting them economically from the ores, the native product falls short of the consumption. Reference has already been made to the coal-fields of China, and their great extent. Some authorities reckon them as being equal in value to all the other coal-fields of the world together, and some time they must certainly become of immense economic importance to the country. The coal occurs both bituminous and as anthracite, but as most of it is raised without machinery, by the rudest forms of manual labour, the price is necessarily high, and the quantity mined is trifling. Defective means of communication partly account for backward state of coal-mining. Coarse mixtures of culm and earth are used as fuel to some extent, while other still more inefficient and less attractive compounds are also employed. Among other mineral substances may be mentioned nitre, alum, gypsum, and, more important than all, inexhaustible beds of kaolin or porcelain earth, the early possession of which by the Chinese, and their great skill in working it, has given the name of China to the beautiful ware which so long monopolized the market of Europe. Jade appears to be found in China in its most perfect form, and is there held in the highest estimation, being wrought into trinkets and into ornamental articles of various kinds. Various precious stones also are found, and agates especially are admirably wrought.

Zoology.—China is said to possess about 200 indigenous mammals and over 760 birds, most of which are found in adjacent parts of Asia, and some are also European. Among the mammalia are several species of the monkey tribe, one of them being the so-called Cochin-China monkey, marked by a striking variety of stripes and colours. Another is the proboscis monkey, in which the combined properties of man and beast seem to be ludicrously caricatured. Of feline animals, tigers and leopards were at one time so numerous as to have been regularly hunted in state by the emperors. That mode of chase is now abandoned, the animals having been extirpated except in certain localities, especially in Yunnan and Manchuria. A small species of wild cat is sought for as game, and served at table as a delicacy. Bears are frequently mentioned, and their paws are said to be in high request among Chinese gourmands. Other carnivora include the lynx, badger, civet, marten, and weasel. The elephant, rhinoceros, and tapir occur in some localities of the south-west. Both camels and elephants are employed as domestic animals, the former only in the north. Bats are numerous, and one large species is extensively used as food. To the indigenous animals already mentioned may be added the wild hog, porcupine, racoon-faced dog or Chinese fox, and several species of rats, more especially one of a yellow colour, larger than those of Europe, and much prized for its skin. Several species of deer are met with, one being the musk deer. In birds, as above indicated, China is extremely rich. Pheasants in particular are famous, both for variety and for beauty. Among others are the well-known gold and silver pheasants, the former one of the most gorgeous of the feathered tribe. The peacock is also indigenous, and fowls akin to our common domestic variety. Birds of prey include eagles, falcons, owls, &c. Song-birds, such as the nightingale and thrush, are well known and much appreciated. Water birds of almost every kind abound, such as ducks, geese, swans, pelicans, &c. The mandarin duck is a Chinese species famed for beauty of plumage. But perhaps the most remarkable water bird is the fishing cormorant, the training of which forms an important employment, and is so complete, that when a bird has secured a fish which from its size he cannot manage singly, his neighbour darts down and assists him to complete the capture. The reptiles of China include several large serpents not regarded as dangerous, and one species at least which is very venomous. Tortoises are common, and are often kept in gardens and pleasure-grounds. No country is said to possess a greater number and variety of indigenous fishes than China. All its waters—its rivers, lakes, pools, canals, and even ditches—are full of fish. This is partly owing to the artificial means by which the natural supply is vastly increased. Boat-loads of water containing spawn are carried to distant parts and deposited in ponds, where the fry are fed with various species of lentils, or with yolks of eggs.

Botany.—The flora is naturally extensive and varied. In the south it is tropical in character, farther north sub-tropical, and still farther there are many plants and trees identical or nearly so with those of middle Europe. Among trees commonly found in China the bamboo (if this gigantic grass should be called a tree), as in India, is perhaps the most valuable of all on account of the almost endless uses to which it is applied. Oaks of different species are common, and the economical uses of the various parts—the wood, bark, and galls—are perfectly understood. Even the acorns of some kinds are ground into flour, and converted into a farinaceous paste. Coniferous trees are represented by numerous forms of pine, yew, and cypress, some of them of great economic importance. The tallow and camphor trees abound, as also the mulberry and paper-mulberry. Palms are not abundant, but the cocoa-nut flourishes in Hainan and on the adjacent coast. The Pandanus or screw-pine is abundant in the south, but the date-palm is not known. The chestnut, walnut, willow, and hazel are all indigenous. The fruit-trees include the fig, mango, guava, lichi, loquat, orange, peach, pomegranate, quince, nectarine, plum, apricot, &c. Plants producing lacquer or varnish, and medicinal herbs of various kinds (including ginseng), are also well known. Among shrubby plants, the first place is unquestionably due to the tea-plant, of which further mention is made below. The next in importance is the mulberry, on the leaves of which the silk-worm is nourished. Among flowering shrubs or trees, the rose, with its numerous varieties, is conspicuous. Nor must we omit to mention the hydrangea, the passion-flower, the lagerstrœmia, in its white, purple, and red varieties; Indian pride, the Chinese tamarisk; various species of cactus, such as the cereus; and the camellia, in almost endless variety. The Chinese flora is particularly rich in varieties of the azalea, and travellers have waxed enthusiastic over the gorgeous beauty of an azalea-clad slope with its masses of flowers of dazzling brightness and surpassing beauty. Altogether the abundance of flowering-plants, shrubs, and trees is a feature of the Chinese flora. *Dwarfing* is a favourite occupation, and it is surprising with what success the Chinese manage to cramp the natural growth of plants, and force them to assume the most fantastic forms. Many of the shapes are curious in the extreme, but the pity is that so much labour and ingenuity should be so perversely employed.

Agriculture.—This first of arts has always been held in the highest veneration in China. The emperor himself, to do it honour, repairs annually to an appointed spot with a large retinue, and, taking the plough in his hand, draws a furrow and sows some seed. A similar festival is held in the capital of each province. A branch of industry thus honoured can scarcely have failed to make great progress, and accordingly the agriculture of the Chinese has been lauded in high terms by almost all who have had opportunities of witnessing it. In the important processes of stirring the soil, eradicating weeds, economizing manures, and applying them in the form best fitted to nourish the crop and bring it to maturity, they display unwearied industry and no small degree of skill. It is a mistake, however, to suppose that they are adepts in what may be called the science of agriculture. They slavishly follow a routine which has been handed down without change from untold generations, and not only display no inventive powers themselves, but from overweening conceit obstinately refuse to profit by the inventions of other countries when placed before them. Their implements generally are of the rudest description, and though improved European and American ploughs have been sent out and urged on their acceptance, they reject them with disdain, preferring a rude shapeless thing drawn by oxen or buffaloes. They appear to have no idea of raising improved breeds of horses and cattle by the arts so well known and practised in other countries. The only animal of which the Chinese can be said to have furnished us with an improved breed is the pig. Their asses and mules are also of good quality. Rice, as the principal food of the people, is the staple crop. The rich alluvial plains which cover a great part of the surface are admirably adapted for its culture, and, by careful management, yield amazing crops—not one merely, but in the south latitudes two crops of rice in the hot season, besides a winter green crop usually ploughed in for manure. In the neighbourhood of Ningpo, lat. 30°, where the summer is too short to mature two crops in succession, they are still obtained by an ingenious device. The rice is sown in seed-beds, and afterwards planted out in drills. A first planting is made about the middle of May, and in two or three weeks after, a second planting is made in the intervals between the previous drills. When the first crop is reaped in August the other is still green, but being stirred and manured, and having plenty of light and air, comes rapidly forward, and is reaped in November. The whole steps of the process are conducted with the greatest care; and the water-wheel, worked by the hand, or by an ox or buffalo, is kept in daily operation from the first planting of the crop till it is nearly ripe. The reaping instrument is not unlike our sickle; and the crop, when not thrashed on the field, as is generally the case, is carried home and built up into stacks, resembling those of Europe. The rice is not always grown on alluvial flats, and there is a variety, known as dry-soil rice, that is cultivated like any ordinary cereal. The sides of the hills are often laid out in a succession of gently sloping terraces, and planted with rice in drills running across the declivity, thus admitting of being irrigated by streams which, retarded at every step, move slowly forward without acquiring any impetus. The same mode of culture is also practised with other crops. In the north the crops principally consist of our ordinary cereals and legumes—wheat, barley, pease, and beans. Vegetables of various kinds are generally grown for household use. Varieties of the cabbage tribe are extensively cultivated for the sake of the oil extracted from the seeds. The raising of green crops to be ploughed in as manure is generally common where rice is cultivated. Two kinds of plants are chiefly employed; one of them, a trefoil, grown on ridges similar to those which form the intervals in our celery beds. Among other crops regularly and extensively grown may be mentioned sugar-cane, used chiefly in a green state; indigo; the castor-oil plant; and numerous plants grown for their roots. The opium poppy is now so extensively cultivated that there is a much smaller demand for the imported article than formerly. Maize, buckwheat, and tobacco may also be mentioned as cultivated crops. Three other plants of the greatest economical importance, and so extensively grown as to form important branches of Chinese agriculture, deserve a separate notice. The first is the mulberry. Judging from the quantity of raw silk annually exported, and the general use of silk for dress, especially by the wealthier classes of the country, it is evident that a large area must be appropriated to the cultivation of this tree, and millions of persons employed in the different processes connected with it. The plants are not allowed to exceed from 4 to 6 feet in height, and are planted in rows, often along the banks of canals. The mulberry farms are small, and are generally worked by the farmer and his family. The Chinese silk is much heavier than the Italian, and preferred in fabrics requiring lustre and firmness. Whether it owes its quality to a particular variety of mulberry, or to the climate or soil, has not yet been definitely ascertained. The second plant more particularly deserving of notice is the cotton-plant. That cultivated in China is of the same species as the ordinary American, namely, *Gossypium herbaceum.* The plant producing the yellow cotton used in the manufacture of *nankeen* appears to be of a more stunted habit than the ordinary cotton. It is chiefly cultivated in a level tract around Shanghai, forming part of the Great Plain, and is the staple summer crop. The culture differs little from that of other cotton countries, more especially the cotton districts of India. The third plant, the tea-plant, is cultivated in two varieties—*Thea bohea* and *Thea viridis*; and though it was long supposed that the former only yielded black and the latter green tea, it is now known that both kinds of tea are obtained from each. The great tea provinces are Quang-tong, Fokien, and Che-kiang. In the first the *Thea bohea* is grown, and the tea is of inferior quality; in the other two the *Thea viridis*, which yields all the finer qualities, and furnishes the greater part of all that is exported to Europe. In these two provinces, where the culture is most extensive and carried to its highest perfection, the tea plantations are usually formed in a deep rich loam, never on the low lands, but on the low hilly slopes. The tea farms, as common throughout China in all kinds of culture, are small, and their management, including not merely all the steps of the culture of the plant, but the preparation of the leaves for market, is almost invariably confined to the farmer and his family. The leaves are gathered thrice—about the middle of April, when the leaf-buds are beginning to unfold; about a fortnight after, in the beginning of May, when the leaves are fully grown; and when the leaves again are newly formed. The first gathering yields the finest and most delicate tea, but with considerable injury to the plants.

Manufactures.—In all the arts necessary to the comfort of life, and in not a few of those conducive to luxury, the Chinese have made considerable progress. One peculiar feature in their processes is the general absence of machinery. Except in a few industries the great moving power is manual labour. The silk stuffs of China have long borne a high name, and in several qualities are still unsurpassed. The loom in common use is worked by two persons, one of whom sits on the top of the frame, where he pulls the treadles and assists in making the various changes which must be made on the machine while in operation. By means of it the workman can imitate almost any pattern. The crapes and flowered satins, and damasks for official dresses, manufactured by the Chinese are particularly excellent. Everybody wears silks. It is the prescribed attire of high officers; soldiers are not considered in full uniform without it. The finer kinds of it form the ordinary dresses of the opulent, while the poorest manage to deck themselves in coarser, if not on common at least on gala days. The embroidery of silk is carried on to an amazing extent, the perfection to which it has been brought creating an almost unlimited demand, both domestic and foreign, and employing myriads of the inhabitants. Steam-power has latterly been utilized in the reeling and spinning of silk. In cotton goods the Chinese make good and substantial fabrics, but the cheapness and good appearance of the foreign goods have given rise to a large importation. Nankeen, once so common in Europe, is still produced as before, and continues to form an important branch of domestic manufacture. Cotton mills and factories of the European type have recently been established. Linen seems not to be made in China. Flax is not grown, but a good substitute for it is found in the fibres of two or three plants, especially ramee, from which the beautiful grass-cloth, similar in appearance to linen, is extensively woven. Woollen fabrics are made only to a very limited extent. The consumption of leather in China is not great, and the manufacture of it is very imperfect. The porcelain of China has been famous from the earliest periods. The manufacture of the finest forms of it being long known to the Chinese alone, gave them the monopoly of the world, and though in elegance of shape and design they must now yield the palm to Europe, for quality of material and rich gorgeous colouring they still hold perhaps the foremost place. Paper is an article that has been made in China from an early period and with great success. The manufacture of glass is not carried on to a great extent, and this is one of the few arts which, at least in regard to its finer processes, the Chinese have condescended to learn from Europeans. In beautiful lacquered ware the Chinese continue unsurpassed. Much of its excellence appears to be owing to the fine varnishes which they have learned to extract from native plants. Except in some few articles the Chinese are backward in the manufacture of metal goods; but recently, and under European leading, machinery, small arms and ordnance, warships, &c., are being produced in the country; as well as soap, matches, and other articles. Many small articles made by hand display much finish and delicacy of workmanship, but the Chinese have never shown much talent for the higher walks of art.

Trade and Commerce.—The inland trade of China, aided by the unusual facilities which it derives from a system of water communication, ramifying like net-work over all its provinces, is of incalculable magnitude. Its rivers and canals are so covered with junks and barges and swarms of smaller boats, that there does not seem much exaggeration in the estimate which makes the tonnage belonging to the Chinese little short of the combined tonnage of all other nations. The inland commerce, however, is much hampered by the rarity of good roads. Railways are as yet little known, but the telegraph is in rather extensive use. One or two short railways have been opened (from Tientsin to Peking for instance), and various long lines are begun or projected. In 1899 concessions for 2800 miles of railway were granted to British capitalists. By the opening of the principal ports the foreign commerce has been immensely increased. Till 1842 the trade with foreigners, exclusive of that carried on by the mainland through the town of Kiachta, with the Russians, was jealously restricted to the mouth of Canton River. By the Treaty of Nanking, in the above year, Hong-Kong was ceded to Britain, and Canton and four other ports were thrown open, namely, Amoy, Foo-chow, Ningpo, and Shanghai. At subsequent dates other ports have been added to the list of treaty-ports for foreign commerce, and about thirty ports are now open, the most northern being New-chwang, in Manchuria, and the furthest inland being Chung-king, on the upper Yang-tse, some 1500 miles from the river's mouth. Steamers do not go higher at present than Ichang (1100 miles), the trade above this being carried on by junks or other craft. Several other of the ports are on the Yang-tse. Of all the Chinese ports, Shanghai, at the mouth of the estuary of the Yang-tse, carries on much the largest trade. The foreign trade at the chief of these ports was, according to recent returns, as follows:—

	Imports.	Exports.
Amoy	£1,688,630	£857,331
Canton	2,149,074	2,845,870
Chee-foo	1,781,650	1,149,078
Chin-kiang	408,122	1,048,000
Chung-king	1,336,979	1,069,017
Foo-chow	774,717	1,011,937
Hang-kow	26,064	518,196
Kiu-kiang	1,169,929	1,062,086
Kiung-chow	219,978	215,551
Mengtsze	1,800,000	1,080,060
New-chwang	1,359,608	1,879,548
Pakhoi	398,509	225,275
Shanghai	21,688,000	9,121,166
Swatow	1,441,687	428,607
Tientsin	894,589	1,486,756
Wuhu	709,291	919,412

Among the countries which maintain commercial relations with the Chinese the principal are Great Britain and her dependencies Hong-Kong and India, the United States, Japan, and Russia, in the following proportions:—Great Britain, &c., £39,271,000; United States, £3,842,000; Japan, £4,795,000; Russia, £2,856,500. The chief article of export from China to Great Britain is tea, but the quantity has decreased from over 145,000,000 lbs. in 1886 to only 14,695,000 in 1898. Great Britain sends to China manufactured goods, especially textiles, the value of the cotton and woollen goods sent in 1898 being about £5,838,000. The total British imports from China in 1898 amounted to £3,400,220, the exports thereto to £7,448,000. The chief article imported into China from India is opium. The foreign trade yields a considerable revenue to the Government, customs duties being collected under the Imperial Customs Department, at the head of which is a European. Much of the coasting trade is carried on by British vessels.

The Chinese, in carrying on their extensive dealings, domestic and foreign, have in all twenty-four weights and measures, but of these only six are in common use, namely, the *liang* or *tael* = 1⅓ oz. avoirdupois, *kin* or *catty* = 1⅓ lb. avoirdupois, and *picul* = 133⅓ lbs., used in weighing bulky articles; and decimals of a *tael*, called *mace* or *tsien*, *candareen* or *fan*, and *cash* or *le*, used in reckoning bullion, gems, drugs, &c., 10 cash making 1 candareen, 10 candareens 1 mace. The only native coin now current is the cash, a small piece of thin circular copper about ¾ inch diameter, with a square hole in the middle for convenience of stringing. Its value is so small that 12 cash = 1 halfpenny. Native silver bullion, called *sycee*, and gold bullion of similar shape, and usually stamped with the names of the banker and workmen, and the year and district in which it is cast, are used in larger transactions. All taxes are paid in sycee of 98 per cent fineness. Private bankers are found in all large towns, and some of them pay interest on deposits. They issue paper money, which passes current in the particular districts where they are known. The Mexican dollar, of the par value of 4*s.* 2*d.*, has been made a current coin all over the empire. In Shanghai, Tientsin, Han-kow, and the northern ports, the tael weight of silver, now equal to about 3*s.* 4*d.*, is commonly used.

People, Language, Religion, &c.—The Chinese belong to that variety of the human race which has been called Mongolian, but in them its harsher features, as represented in the genuine Tartars, are considerably softened. They are generally of low stature, have small hands and feet (the last often artificially made so small in the females as to become a deformity), an olive or yellowish complexion, much modified by the degree of its exposure to the open air, prominent cheek-bones, depressed nose, eyes obliquely turned upwards at the outer extremities, black hair, beard scanty. In bodily strength they are far inferior to Europeans, but superior to most Asiatics—their great assiduity and patient endurance of fatigue making them highly prized as labourers throughout the Indian Archipelago. Perhaps the finest physical specimens of the race are to be seen among the coolies or porters of Canton. The Chinese are deficient in courage, yet often display great contempt for death. In their moral qualities there is much that is amiable. They are strongly attached to their homes, hold age in respect, toil hard for the support of their families, and in the interior, where the worst kind of foreign intercourse has not debased them, exhibit an unsophisticated and pleasing simplicity of manners. In the great mass these qualities are counterbalanced or rather supplanted by numerous vices—treachery, lying, and various others.

The Chinese is the most important and most widely-spread of the so-called monosyllabic languages of Eastern Asia, in which each word is uttered by a single movement of the organs of speech. The difficulties which foreigners experience in learning to speak it are largely owing to the peculiarities of pronunciation, numerous consonants and imperfect vowel sounds not known, at least in any European language, being in constant use, and varieties of tone producing endless varieties of meaning. There is no Chinese alphabet, but only characters representing words or ideas. The written characters appear to have been originally rude copies of the natural and artificial objects designed to be expressed by them, and hence so far as this system was carried each separate object must have been represented by a separate character. Some writers, assuming that the whole language was formed on this principle, have concluded that a knowledge of it was only to be attained by submitting to the intolerable drudgery of cramming the memory with myriads of arbitrary marks. It is stated, however, that seven-eighths of the characters have been formed from less than 2000 symbols, and that any person well acquainted with these has obtained a good introduction to the reading and writing of Chinese. In writing or printing the characters, they are arranged in vertical columns, to be read from top to bottom. The art of making paper is said to have been known in the first century, and printing from wooden blocks in the seventh or eighth century, hundreds of years before these valuable arts were invented in Europe; and in the books which have continued since to appear in great numbers are to be found treatises on almost all subjects—science, history, geography, belles-lettres, and poetry—embodying a literature of no mean description. In China literary eminence is the sure avenue to the highest honours and offices of the state, appointments being obtained by competitive examination; hence it has been said that 'the *literati* are the gentry, the magistrates, the governors, the negotiators, the ministers of China'. Naturally among the more comfortable classes education of the kind which promises to be best rewarded is almost universal. For the lower classes also every village throughout the empire has its school, but the subjects taught are of the most elementary description, and attendance is far from general, and is only extended to the male sex. A few newspapers and periodicals are published in Chinese, especially at Hong-Kong.

Judging by the multitude of temples and joss-houses seen in every quarter, and the endless number of ritual acts performed on high festivals and in the ordinary intercourse of life, the Chinese are a most religious people; but superstition and idolatry are much more prevalent than real religion. The religion of the state, if it may be so called, is Confucianism, a system founded by Kong-Fu-Tse or Confucius, about 550 B.C. The worship of heaven or a supreme being as well as natural powers belongs to it, and it teaches a pure morality. Another religion is Taouism, introduced about the same time by Lao-tze, and numbering a good many adherents. (See CONFUCIUS, LAO-TZE.) Among the great mass of the people a form of Buddhism prevails, or a curious mixture of religious ideas and forms. Attempts to introduce Christianity were made by the Nestorians as early as the sixth century, but the celebrity of the Jesuit missions has thrown all others into the shade. The Roman Catholics now claim to have about 1,000,000 adherents among the Chinese. Various Protestant bodies carry on missionary operations in China, but hitherto with indifferent success, though it is said there are now about 50,000 native Protestants.

Customs, Manners, Dress, &c.—Among the Chinese politeness in their intercourse with each other is carried to an extreme, but still forms an agreeable characteristic of their social relations. They scrupulously avoid all contradiction in conversation, and are careful not to use any offensive or irritating expressions. From the same source arises the tedious, frivolous, and often absurd etiquette and extravagant compliment for which the Chinese are remarkable. But even here a wish to please and gratify is sufficiently evident. An invitation to dinner is written on a slip of red paper, and is sent some days before; it is usually in this style—'On the —— day a trifling entertainment will await the light of your countenance; Tsau Sanwei's compliments'. This is followed by another card naming the hour. The dinner itself is sumptuous, wine and spirits are drunk freely, and the whole affair goes off with a great deal of boisterous merriment. Fresh pork, fish, and fowls form the staple articles of food, with vegetables of various kinds. Beef and mutton are rare. Opium-smoking is a very common habit, but in comparatively rare cases is it carried to a markedly injurious excess. Tobacco is also in common use. The usual beverage among all classes is tea, of which the Chinese consume enormous quantities.

In ordinary cases, strict separation prevails between the male and female branches of a household. Betrothment is entirely in the hands of the parents, and is conducted through the medium of a class of persons called *mei-jin*, or go-betweens, whose office of matchmaking is considered honourable. The marriage itself is conducted with much ceremony, gay processions, and other convivialities. Besides one wife strictly so called a man who can afford it may have several subordinate wives. A wife may be divorced on several grounds that we should deem frivolous. Infanticide is common among the very poor, the female children being almost alone the victims.

The return of the new-year is an occasion of unbounded festivity and hilarity in China, and new-year's day is a universal holiday for rich and poor. At this season all accounts are expected to be adjusted, and if this is delayed or neglected the creditor has sometimes recourse to the expedient of carrying off his debtor's door, leaving his premises exposed to interlopers. On new-year's morning all shops are shut, and this usually continues for several days. There are also various festivals throughout the year, but no weekly day of rest. Gambling is universal in China. Porters play by the wayside while waiting for employment; and hardly has the retinue of a great official seen the latter enter the house when they pull out their cards or dice and squat down to a game. Dress, like other things, undergoes its changes in China, and fashions alter there as well as elsewhere; but they are not as rapid or as striking as among European nations. Regarding dress there are certain restrictive laws in operation. The mandarins or officials have some special peculiarities of dress, and their respective ranks are indicated by the nature of the knob or button they have on the top of their hats. The wearing of the queue or pigtail is perhaps the Chinaman's most noticeable external peculiarity as regards costume. The head-dress of married females is becoming, and even elegant. The copious black hair is bound upon the head in an oval-formed knot. No caps, bonnets, hoods, or veils are worn abroad; a light bamboo hat, or an umbrella, protects from the sun. The extraordinary practice, peculiar to China, of compressing the feet of females (especially those of the better class) into unnatural form and dimensions has been already alluded to.

Dwelling-houses are generally of one story. The common building materials are bricks, sifted earth, matting, or thatch for the walls, stone for the foundation, brick tiling for the roof, and wood for the inner work. The fronts present no opening but the door. The walls are often stuccoed, but not painted, and the bricks are occasionally rubbed smooth with stones, and the interstices pointed with fine cement. The general internal arrangement of a Chinese dwelling of the better sort is that of a series of rooms of different dimensions, separated and lighted by intervening courts, and accessible along a covered corridor, communicating with each, or by side passages leading through the courts. Streets are generally so narrow as to be mere lanes. The most characteristic Chinese structures are the pagodas, built generally with a number of stories, each marked off from the rest by a peculiar projecting portion.

Government, Laws, Army and Navy, &c.—The government is an absolute despotism. The emperor unites in his person the attributes of supreme magistrate and sovereign pontiff, and theoretically as 'Heaven's Son' is to heaven alone accountable. In practice, however, the rigour of this despotism is considerably softened, and the greatest blot upon the Chinese administration is the corruption which in every form that ingenuity can devise is rampant throughout the empire. The emperor's principal ministers, four in number, two of whom are Manchus and two Chinese, form an interior council chamber, and beneath them are a number of assessors who form the principal council of state. The government business is distributed among seven boards, having cognizance respectively of the conduct of civil officers, of revenue, of rites and ceremonies, of military affairs, of naval affairs, of crime, and of public works. Another board (the Tsung-li-Yamen) has the charge of what may be called the foreign affairs, and is the medium of intercourse with foreign powers. There is, besides, an office of censors, forty or fifty in number, who go out into the empire as imperial inspectors, and are privileged to make any remonstrance to the emperor without endangering their lives. The provinces, either singly or by twos, are under a governor and sub-governor, and each province has also a chief criminal judge and a treasurer. Particular magistrates preside over particular districts and cities, and instead of being permanent are changed about once in three years. The great object aimed at is to maintain a strict surveillance and mutual responsibility among all classes; in other words, to imbue them with fear of the government, and infuse a universal distrust. The chief protection of the people is in a body of laws, called Ta-Tsing-Liuh-Li, that is, 'statutes and rescripts of the great pure dynasty', which are held in high regard, and agreeably to which, with occasional violations, all public functions are discharged. The Chinese army has been subjected to a certain amount of reorganization in recent years, and an attempt has been made to introduce improvements from the European countries. In each important town there is a Manchu force, and the total Manchu army is estimated at 270,000 men, with an organization of its own. There is a Chinese army separately organized from this, forming a kind of militia, supposed to include some 800,000 men. A considerable number of the men are now armed with rifles of European pattern, and the European drill has been partially introduced. Li-hung-chang, when governor of Pechili, organized a corps of instruction drilled and trained on the European model, and this comprises 10,000 men. Numbers of Krupp guns are mounted on the fortifications; and there are arsenals superintended by Europeans. The navy contains several cruisers and other war-vessels of the modern type, but the Chinese lost their most powerful ships in the war with the Japanese, and their navy is now of comparatively little strength. The revenue of the empire is derived from customs, excise, and more especially from the land and salt taxes, but it is impossible to obtain authentic information with regard to the amount of the Chinese revenue. According to the most recent estimate the total receipts of the government amount to about £16,000,000, of which two-thirds is believed to be embezzled in course of collection. Opium is an article from which a portion of the revenue is derived. The total Chinese debt is at present £54,000,000, which has been raised at different times on the securities of the customs and the inland transit duties.

History.—The early history of the Chinese is shrouded in fable, but it is certain that civilization had advanced much among them when it was only beginning to dawn on the nations of Europe. The names of numerous dynasties belonging to a period two or three thousand years before Christ are still preserved, but how much, if any, of this early history is authentic, cannot be determined. The Chow dynasty, which was founded by Woo-wang, and lasted from about 1100 B.C. to 255 B.C., is perhaps the earliest that can be regarded as historic, and even of it not much more is historic than the name. Woo-wang is said to have divided the kingdom into seventy-two feudal states, and the continual internal rivalries which resulted from this policy encouraged Tartar raids and invasions. Under Ling-wang, one of the sovereigns of this dynasty, Confucius is said to have been born in 551 B.C. During the latter half of the period during which this line of sovereigns held sway, there appear to have been a number of rival kings in China, who lived in strife with one another. Chow-siang Wang, who was the founder of the Tsin dynasty, attempted to bring all China under his rule, but he was unsuccessful. His great-grandson, however, a national hero of the Chinese, who was the first to assume the title of 'Hoang' (emperor), and henceforth called himself Tsin-She-Hoang-ti, succeeded in accomplishing this. He ascended the throne at the age of thirteen and fixed his capital at what is now Se-gan-foo. Besides building a great palace there, he constructed numerous roads, canals, and buildings throughout the country. He completely defeated several Tartar and other neighbouring tribes, and suppressed a revolt in his own country. The Great Wall of China was begun by his command, and it was he who ordered all books treating of the past history of China to be destroyed. The present name of China is derived from the name of this dynasty. The Tsin dynasty ended with Hoang-ti's grandson, who gave way in 206 B.C. to Lew Pang or Kaou-te, the founder of the Han dynasty. Towards the end of the second, or soon after the beginning of the third, century of the Christian era, the empire was divided into three states, which were again united under one ruler before the end of the third century. During the tenth century the right to the throne was disputed, and civil war raged till an adjustment took place by the establishment of the Tsoong dynasty under Tae-tsoo, A.D. 960. Under this dynasty great progress was made in literature and art. Inroads of Tartar hordes now pressed the Chinese so hard that they called in the aid of the Mongols or Western Tartars, who freed them from their oppressors, but gave them a new master in the celebrated Kublai Khan who founded the Mongol dynasty, and removed the capital from Nanking to Peking. His ninth descendant was driven from the throne and a native dynasty called Ming again succeeded in 1368 in the person of Hungwu. A long period of peace ensued, but was broken about 1618, when the Manchus gained the ascendency, and after a war of twenty-seven years established the existing Tartar dynasty in the person of Tungtchi. According to the Chinese, their dynasties, twenty-six in number, embrace a period of about 5000 years, during which between two and three hundred sovereigns have held the throne. The earliest authentic accounts of China, published in Europe, are those of Marco Polo, who visited the country in the thirteenth century. The first British intercourse was attempted under Queen Elizabeth in 1596, but the vessel sent did not reach its destination. A trade was subsequently established at Canton by the East India Company, but no direct intercourse between the governments took place till the embassy of Lord Macartney in 1793, which was well received by the Emperor Keen Lung. A second embassy in 1816 by Lord Amherst, was treated with insolence, and returned with a letter from the emperor to the Prince Regent, bearing among other things, 'I have sent thine ambassadors back to their own country without punishing them for the high crime they have committed'. The arrogance thus manifested could not fail, sooner or later, to bring on a collision; and accordingly, in 1841, the British, on being refused redress for injuries, partly real and partly alleged, proceeded to hostilities, and after scattering almost without a struggle every force which was opposed to them, were preparing to lay siege to Nanking, when the Chinese found it necessary to sue for peace. A treaty was then concluded, by which the five ports of Canton, Amoy, Foo-chow, Ningpo, and Shanghai were opened to British merchants, the island of Hong-Kong ceded to the British in perpetuity, and the payment of 21,000,000 dollars agreed to be made by the Chinese. In 1850 an insurrection headed by Hung-seu-tseuan or Tien-te, who gave himself out as a descendant of the Ming dynasty, broke out in the provinces adjoining Canton, with the object of expelling the Chinese Tartar dynasty from the throne, as well as of restoring the ancient national religion of Shan-ti, and of making Tien-te the founder of a new dynasty, which he called that of Tae-ping, or Universal Peace. After the capture and execution of Tien-te his place was taken by Hong-sin, who identified Shan-ti with the God of Christianity, and regarded himself as called of God to make the old true religion of China again predominant. For a long period the insurgents succeeded in maintaining their ground against the imperial forces, and it was not till after the lapse of several years that the latter were enabled in some degree to quell the rebellion. Notwithstanding the cruel retaliation by the victorious party, and the wholesale massacres perpetrated on the insurgents, they were unable to stifle the spirit of revolt. In October, 1856, the crew of a vessel belonging to Hong-Kong were seized by the Chinese on the allegation that they had been concerned in a piratical attack on a Chinese vessel. The men, on the remonstrance of the British authorities, were afterwards brought back, but all reparation or apology was refused. The attitude taken up by the Chinese in this matter led to a declaration of war, and in 1857 the Chinese fleet was almost totally destroyed, and Canton was taken by the French and English troops. A treaty was at length concluded with Lord Elgin on behalf of the British, by which important privileges were secured; but an attack on the French and English ambassadors who were on their way to Peking to have the treaty ratified by the emperor led to the renewal of the war. The allied forces marched towards Peking, and after twice defeating the Chinese troops entered the city. This brought the Chinese to their senses, and the treaty was ratified. Meantime the Taeping rebellion had been gaining strength, and the trade of Shanghai and Canton was materially interfered with. The British thereupon decided to assist the Chinese in quelling the insurrection, and the services of a young engineer officer, Captain Charles Gordon ('Chinese Gordon', afterwards so well known in connection with the Soudan), were lent to the government for that purpose. The rebels were gradually driven from their posts, and in July, 1864, Nanking, their last stronghold, was taken. But the empire was still disturbed by rebellion in other parts. The Mohammedans in Chinese Turkestan, wishing to take advantage of the weakness to which the Chinese government had been reduced by the Taeping rebellion, revolted almost simultaneously, but apparently independently, with those in the province of Yunnan in the south-west. In both cases the rebellion resulted in the temporary separation of the provinces from the empire. In 1883 hostilities broke out between China and France in consequence of the warlike operations of the latter in Tonquin and her claim to the protectorate of the country; but the matter was arranged early in 1885. In 1894 war broke out with Japan in connection with Chinese misgovernment in Corea, and in this struggle Japan had almost an uninterrupted success both by land and sea, driving the Chinese out of Corea, and invading China at several points. Peace was concluded in 1895, China agreeing to give up Formosa and pay a large indemnity to Japan, to open additional ports to foreign commerce, and to recognize the independence of Corea. In the autumn of 1897 two German missionaries were murdered in the province of Shan-tung, and the admiral commanding the German squadron on the China station immediately effected a landing in the bay of Kiao-Chow, which, after much discussion, was finally leased to Germany early in January, 1898. This acquisition of Chinese territory by Germany attracted much attention among other powers whose interests were likely to be affected, and was followed at brief intervals by the leasing of the town and harbour of Port Arthur in the Liao-Tong Peninsula to Russia, and the leasing of the bay of Wei-hai-Wei to Great Britain. On the 22nd September, a *coup d'état* was effected by the dowager-empress of China, who had acted as guardian to the emperor Kwangsu during his minority, by which the emperor was again placed under her dominion. The prompt remonstrances of the representatives of the powers at Peking served to prevent any extreme procedure on the part of the empress and her advisers, and the emperor afterwards nominally regained power, but early in 1900 was reported to have abdicated.

In May, 1900, a secret society, colloquially known as the 'Boxers', rose in the provinces of Shan-tung and Pechili and massacred native Christians and European missionaries. The Boxers were encouraged by the empress-dowager and the palace-party at Peking, who placed themselves at the head of a movement directed against foreigners. The ministers at the European legations in Peking—Sir Claude Macdonald being at the head of the British legation—determined to requisition guards for their protection, and these arrived on 31st May. On 4th June the Boxers destroyed the Peking-Tientsin railway, and by cutting communications isolated the Europeans in Peking. Soon after the chancellor of the Japanese legation and Baron von Ketteler, the German minister, were murdered in the streets. In hope of relieving the legations Admiral Seymour put himself at the head of 2000 European troops and bluejackets, and set out from Tientsin for Peking, but had to retire. Meanwhile the Chinese had been manning the Taku forts at the mouth of the Peiho, and making preparations for closing the entrance to the river. The commanders of the allied fleets—British, French, Russian, and German—in the Gulf of Pechili gave notice to the Chinese to desist. The Celestials in reply opened fire on the European vessels (17th June), whereupon the allies bombarded and destroyed the forts. All this time the legations at Peking were closely besieged and constantly bombarded. The smaller legations having been destroyed or rendered untenable, their occupants, together with a number of native Christians, took refuge in the British legation, which, from its extent and strength, offered a better prospect of protection. It was, however, ill supplied with provisions, and the defenders were reduced to extremities, when a relief force of 12,000 men, comprising British, French, German, Russian, and Japanese troops, forced its way from Tientsin (15th August). Before the arrival of this force the empress-dowager and her court, with the emperor Kwangsu, had fled from the capital, and it was impossible, with the troops and transport available, to overtake them.

Troops of various nationalities had been despatched from Europe to North China with all possible haste, and Count von Waldersee, the German commander, had been accepted by all the allies as commander-in-chief, but international jealousies soon made themselves apparent, and complications seemed likely to ensue. On 20th October it was announced that Lord Salisbury had concluded an agreement with Germany which put a new aspect on the situation. By this the two powers bind themselves to the principle of the 'open door' in China, to abstain from making use of the present crisis to obtain for themselves any territorial advantage in China, and to take such steps as may be agreed on for the protection of their interests, in the event of any other power seeking to obtain any exclusive territorial advantages for itself. This agreement having been submitted to the other powers, received the adhesion of all; but the outlook is still viewed with general uneasiness and uncertainty.

The position of China to-day is one without a parallel in the history of nations. Of vast extent, possessing boundless though undeveloped wealth, and containing the largest population of any country in the world, the empire is retarded in progress and restricted in intercourse by the corruptness of its governing class. Since the Chinese have never attempted to exploit the resources of their country or to encourage the development of its trade, it has been left to pioneers from other and more progressive nations to attempt to do both, and for more than two centuries their efforts have been more or less successfully opposed by the Chinese. The increased intercourse which has been manifested during the past few years between China and the western powers has tended to bring the vast population into closer touch with western ideas, and the question of to-day is no longer whether the Chinese will tolerate the presence of the foreigner, but which particular nation shall obtain the greatest privileges within the Celestial Empire. The rivalry of the different powers concerned in the opening up of China is very keen, and it is yet undetermined as to how the question will be settled. Great Britain desires to see the empire freely opened to all traders irrespective of nationality, while Russia and France aim at the acquisition of portions of Chinese territory for their own exclusive advantage. It is this conflict between a partition of China into spheres of influence and the maintenance of the empire in its full integrity while opening it up to trade with the rest of the world that is occupying the attention and the efforts of diplomatists. For the history of the empire see Boulger's History of China (1898); for the manners and customs of the people, Professor Douglas's Society in China (1894), and Holcombe's The Real Chinaman (1895); and for an account of the political-commercial aspects of the China question see Krausse's China in Decay (1900).

CHINA INK, or INDIAN INK, a black solid substance, which, when rubbed down with water, forms a very pure black indelible ink. It has been used in China from time immemorial, and both there and in Japan is employed for writing, small brushes being the implements made use of. In Europe it is used by draughtsmen, artists, &c. It is manufactured in various ways and from various materials, but consists essentially of fine lampblack incorporated with a gluey substance, the whole being dried and consolidated into cakes and sticks. Some kinds are made with animal or ivory black, others with lampblack got from camphor or oil of sesame. There is generally added some perfume—a little musk or camphor. Many attempts have been made to imitate Chinese ink, some of which have been tolerably successful. Almost all the imitations consist of carbon ground up with gum, gelatine, or fish-glue, but the quality and tint may vary according to the special carbon employed and the process of manufacture. Good Chinese ink should have a velvety black appearance, with a gloss which becomes very conspicuous on rubbing. The colour it gives on paper should be pure black and homogeneous, and if water be passed over it it should not run or become streaky.

CHINANDEGA, a town of Nicaragua, Central America, 20 miles north-west of Leon, and 10 miles from the port of Corinto on the Pacific, with which and with Managua, &c., it is connected by railway. It is a place of considerable trade. Pop. 8000.

CHINA SEA, that part of the North Pacific Ocean bounded N. by Formosa, N.W. by China, W. by Anam and the Malay Peninsula, S.E. by Borneo, and E. by the Philippines. It contains numerous islands, receives several considerable rivers, and forms the important Gulfs of Siam and Tonquin. The currents in this sea are very mutable, depending much upon local circumstances.

CHINA-WARE, or PORCELAIN, the finest and most beautiful of all the kinds of pottery-ware, and differing from other kinds in being slightly translucent, while it is also white, hard, and less fusible. It is made of a special kind of clay—kaolin or porcelain clay (see KAOLIN),—and was first made in China.

The Chinese are said to have been acquainted with the manufacture of porcelain upwards of two centuries previous to the Christian era, but it was not till five or six centuries later that they appear to have attained to any great skill or perfection in the art. Since A.D. 422, as far as can be ascertained from the Chinese records, the town of King-te-chin, in the province of Kiang-si, has been renowned as producing the best porcelain in the empire, a pre-eminence which it is said to owe to the fact that kaolin was first discovered and utilized here. For upwards of a thousand years China was the only country in the world which possessed a knowledge of the manufacture of porcelain, so much so that the name *china* is still commonly applied to designate this species of ware, of which by far the greater quantity now is obtained from other places. Following out the principle of conservatism which seems so essentially characteristic of the Chinese, they appear, after attaining a certain degree of perfection in this beautiful art, to have made no further progress, and for ages to have continued without variation to produce china-ware of the same styles and qualities as that which had become celebrated. The acknowledged inferiority of modern Chinese porcelain is attributed by some to the circumstance of European merchants either not having the taste to choose works of merit, or being obliged to regulate their purchases by the demand in the home market, and the rage for cheapness so prevalent in the present age. But it would appear that the Chinese have now lost the art of fixing or producing in porcelain those beautiful colours which we admire so much on their ancient vases. Hence arises the great value set on ancient china-ware, both by the natives of the country and Europeans. Fragments of a deep sky-blue porcelain, made about 954 A.D., are said to be set by the modern Chinese as if they were rich jewels. Most of the modern ware produced in China is feeble or ugly in design and inartistic in ornamentation, the best being such as displays Persian influence.

The art of making porcelain was introduced into Japan from China about 1513, or, according to some, at a date considerably earlier. Much of the Japanese ware was made in imitation of the Chinese, and on the whole they are more successful with other kinds of pottery than with porcelain. In the eighteenth century much Japanese porcelain was exported to Europe, where it was often copied by the manufacturers.

Porcelain was known in Europe from the thirteenth century onwards, and from its beauty and rarity commanded universal admiration and popularity. For a long period it was erroneously believed that China alone furnished the proper kind of clay necessary for its manufacture, and this circumstance, along with the then extremely rude state of the potter's art in Europe, long prevented any attempt towards the fabrication of this article in the West. Towards the end of the fifteenth and early in the sixteenth century porcelain is said to have been made at Venice, and it was also produced at Florence under the Medici, about 1580–85, as well as in France in the following century; but the ware was not the true porcelain, but soft or artificial porcelain. At length John Frederick Böttcher, Böttger, or Böttiger, a native of Saxony who had long devoted himself to the futile pursuits of alchemy, working under the patronage of the elector, Augustus II., was led in the right direction in 1710. Having his attention accidentally attracted to a species of white earth used as a substitute for flour in the manufacture of hair-powder, Böttcher renewed his experiments, and ascertained that by means of this substance a porcelain could be produced equal to that of China. This now led to the establishment by the government of the far-famed porcelain manufactory at Meissen, near Dresden, of which he was appointed director. The Saxon porcelain soon became celebrated over Europe, and rivalled that of China in the excellence of its quality and the beauty of its decorations. Every possible endeavour was made to prevent the secret of its manufacture being conveyed to other countries. The workmen at the factory were sworn to secrecy, and the exportation of the porcelain earth prohibited under the severest penalties. In this attempt the Saxon government was for some time successful, but the secret was at last gradually divulged, and porcelain works established at Vienna (1720), Munich, Berlin, and other places in Germany. In France the famous Sèvres manufactory was established by Louis XV., but hard or true porcelain was not made there till about 1770. The works still retain their old renown. In

England a porcelain work was established at Chelsea for some years previous to 1745; porcelain was also made at Stratford-le-Bow about the same year, at Derby as early as 1750, and at Worcester in 1751; but it was not till after the discovery of kaolin clay in Cornwall, about 1755, that hard porcelain began to be manufactured, first, it appears, at Bristol in 1766. In connection with the manufacture the names of Josiah Spode and Thomas Minton should be mentioned, both of them as belonging to the industry established in Staffordshire before the end of the eighteenth century, Thomas Minton being succeeded by his still more famous son, Herbert.

Porcelain, when broken, presents a granular surface, with a texture compact, dense, firm, hard, vitreous, and durable; it is semi-transparent, with a clear, smooth, glassy surface, unaffected by all acids excepting hydrofluoric, and resisting uninjured sudden changes of temperature. In the properties of being semi-transparent and semi-vitrified, but in scarcely any of the preparatory processes and manipulations, is china-ware distinguished from good earthenware. Various articles for the use of the table and the toilet are usually formed of china-ware, as also chemical utensils, retorts, alembics, crucibles, and many other articles indispensable in the laboratory. For the process of manufacture see Pottery; and see also Ceramics.

CHINCHA ISLANDS, a group of small islands off the coast of Peru; lat. 13° 38′ s.; lon. 76° 28′ w. They are granitic, arid, and destitute of vegetation, and the coasts bold and difficult of access. Immense deposits of guano used to exist here, but after being exported for thirty-four years the supply became exhausted in 1874. The Peruvian government usually farmed the right of export to each of the principal countries of Europe, receiving large sums from capitalists, who were remunerated by the guano shipped.

CHINCHILLA, a genus of South American herbivorous rodents, closely allied to the rabbit, which it resembles in the general shape of the body, though it has a longer tail, and broader and more rounded ears. Several species are known, but the only one particularly deserving of notice is *C. lanigera*, which is about 15 inches long from the muzzle to the tip of the tail, and covered with long soft fur of a beautiful gray, waved with white above and of a brighter shade below. Chinchilla skins are much esteemed as furs, being both very warm and very beautiful. The chinchilla lives gregariously in the mountains of many parts of South America, and makes numerous and very deep burrows. It is of a mild and gentle nature, very sportive, losing none of its gaiety in captivity, and very cleanly. When eating it usually sits on its hind-legs like the squirrel, using its fore-paws to carry the food to its mouth.

CHINCHILLA, a city of Spain, in Murcia, in the province and 10 miles s.e. of Albacete, on a rocky eminence. It is surrounded by a wall and commanded by a castle. Its handsome parish church has three naves, and a lofty tower containing six bells; the interior is richly decorated and contains pictures and other works of art. Quarries of granite, alabaster, gypsum, and limestone are wrought in the vicinity. Pop. (1887), 6096.

CHINESE GRASS, China Grass, Rhea or Ramie Fibre, the fibre of *Boehmeria nivea* and *B. utilis*, two Chinese plants of the order Urticaceæ (nettles). They grow to a height of about 5 feet, and have large long-stalked cordate leaves, which in the former species are white on the under surface. The fibres of the stem are very fine, silky, and strong, and are made into grass-cloth in Southern China. The cultivation of the plants has been introduced into India, Jamaica, the United States, and elsewhere, and by means of improved processes the fibre is obtained in sufficient quantity to render it suitable for being employed in the manufacture of a variety of fabrics. See Boehmeria.

CHINESE TARTARY, an old name of Eastern or Chinese Turkestan.

CHINESE WHITE, a pigment consisting of the white oxide of zinc (ZnO). It has been introduced into the arts as a substitute for white-lead.

CHINGLEPUT, or Chengalpat, a coast district and its capital, Hindustan, in the Carnatic. Presidency of Madras. The district, which lies s. of Nellore and n. of South Arcot—area, 2842 square miles—has generally a bad soil, broken up frequently by granite rocks. Water being scarce, a large portion of the land does not repay the cost of cultivation; the more fertile localities yield grain, fruit, oil, &c., which are exported to Madras. There are manufactures of cloth on a small scale. The chief towns are Conjeveram, St. Thomas' Mount, Saidapet, Tiruvotiyur, and Chingleput. This tract of country was, in 1760 and 1763, obtained by the East India Company from the Nabob of Arcot. It was invaded by Hyder Ali in 1768, and again in 1780, when it was nearly depopulated by famine and emigration. Pop. (1891), 1,136,928.—The town, capital of the district, is 15 miles w. from the Bay of Bengal, and 35 miles s.s.w. Madras, in a small valley, confined on all sides by hills, and nearly half covered by an artificial lake. There is a railway junction here, and the town has civil and criminal courts, jail, hospital, and Roman Catholic and Protestant missions. The fortress, formerly of considerable extent and strength, has been allowed to go into decay, and is now useless for military purposes. In 1751 it was taken by the French, but in the following year was retaken by the British under Clive. It also figured in subsequent military operations. Pop. (1891), 6180.

CHIN-HAI, a seaport in China, at the mouth of the Yung river, leading to, and 9 miles n.e. of, Ningpo. It consists of the town proper, surrounded by walls 3 miles in circuit, and of extensive suburbs, and has a citadel situated on a precipitous cliff. In 1841 the Chinese were signally defeated by the British in a battle fought here, which was soon after followed by the capture of Ningpo.

CHIN-KIANG-FOO, or Tchang-Kiang, a city of China, in the province of Kiangsu, on the right bank of the Yang-tse-Kiang, near the junction of the Imperial Canal, 150 miles from Shanghai; one of the treaty ports. It is advantageously situated for trade, and surrounded by a lofty and solid wall 4 miles in extent, with hills of considerable height beyond. Extensive suburbs stretch along the river and the canal, and the bustle and activity exhibited on the waters afford a striking evidence of the industry of the natives and of the commercial importance of the city. It forms, indeed, the key of the empire, as the blockade of the river and canal at this spot would in a great measure prevent all communication between the north and south. The city is fortified, but in 1842 it was taken by the British after a determined resistance on the part of the Manchoo garrison. It was also taken by the Taepings on 1st April, 1853. They defeated the Imperialists here on 1st January, 1856, and finally abandoned the city in 1858. Cotton goods form the chief import, and the exports are numerous and valuable; total imports in 1898, £2,675,943; exports, £644,830. Pop. 200,000.

CHINOLINE (C_9H_7N), a body obtained from quinine and some other alkaloids, by distilling with very strong potash. It is an oily base a little heavier than water, in which it dissolves slightly. It is quite soluble in alcohol and ether. It is transparent and colourless, with a slight odour. It forms a large number of single and double salts, which crystallize readily, and are sometimes of great beauty. The chromate is a very beautiful salt. There is a number of alcoholic derivatives, from one of which, *amylchinoline hydriodate*, a substance called *cyanin* has been prepared. To the hydriodate potash is added, a resin precipitates, and this dissolves in alcohol with a superb blue colour. Attempts have been made to use this colour in dyeing, but it is too fugitive.

Chinoline was originally identified with a base obtained from coal-tar. Further investigation has shown that the bases derived from the two sources, though identical in composition, are different in properties, and to that from coal-tar the name *leucoline* has been given. Leucoline does not yield cyanin.

CHINON (anciently *Caino Turonum*), a town in France, department Indre-et-Loire, on the Vienne, at the base of a hill crowned by the ruins of an old castle (in which Henry II. of England died), 28 miles S.W. of Tours. There is a monument to Rabelais, who was born here. Pop. (1891), 4265.

CHINSURAH, a town in Hindustan, beautifully situated on the Hugli, and now included in the town of Hugli, 20 miles north of Calcutta. It is a military station, was formerly a Dutch settlement, and contains many neat houses in the Dutch style. It is celebrated for the manufacture of cheroots, and has several schools, among them some belonging to the Free Church of Scotland. See HUGLI.

CHIO, called by the ancients *Chios*. See SCIO.

CHIOBBE, a town in China, province Fokien, 15 miles S.W. of Amoy, with a population estimated at 300,000. It is situated on a river bearing different names, navigable by junks of 400 tons, and is defended by a citadel and numerous other fortifications. It is the great emporium for common china-ware, and has important fisheries. The rearing of silk-worms forms an important occupation.

CHIOGGIA, or CHIOZZA, a seaport town of Italy, on one of the lagoon islands of the Adriatic, in the province of Venice, and 15 miles W. by S. of the city of Venice. It is built partly on piles. The principal street is lined with porticos; and there are many handsome edifices, among which the cathedral is conspicuous. A stone bridge of 43 arches connects the south extremity of the island with the mainland. The harbour admits vessels drawing 17 feet. The town is defended by forts and batteries. It is one of the strongest places in the Venetian lagoons. A large trade is carried on in German and Italian produce, and there is an active fishery and coasting trade. The manufactures consist chiefly of cordage and lace. Pop. (1881), 25,084.

CHIPPENHAM, a municipal borough, England, Wiltshire, 12½ miles N.E. of Bath, on the Avon, here crossed by a fine old stone bridge of 22 arches. It consists of one principal street, with others diverging from it. It contains two large churches with lofty spires, several other places of worship, an old and a new town-hall, &c. New secondary schools have been erected. The station of the Great Western Railway here is a very large one. The town is an important mart for cheese, and contains a woollen factory, a silk factory, large condensed-milk factory, railway works, boot factories, a bacon factory, &c. The town is supplied with good water from an artesian well. Chippenham now gives name to a parl. div. Pop. (1891), 4618; (1901), 5074.

CHIPPEWA, a river of the United States, Wisconsin, formed in the N. of the state, and after receiving several tributaries running S.W. into Lake Pepin, an expansion of the Mississippi.

CHIPPEWA FALLS, a town of the U. States, Wisconsin, a railway centre, situated at falls of the river Chippewa which furnish important water-power. Pop. (1890), 8670.

CHIPPEWAYS, or OJIBWAYS, a tribe of North American Indians, inhabiting Minnesota and others of the northern United States, and various parts of Canada. They are tall, active, and well-formed, and subsist chiefly by hunting and fishing. They amount to about 11,000.

CHIPPING NORTON, a municipal borough and market town of England, in the N.W. of Oxfordshire, with an interesting old parish church, R. Catholic and other places of worship, town-hall, &c. Woollen goods and gloves are made, and brewing is carried on. Pop. (1891), 4222; (1901), 3780.

CHIQUITOS, a race or stem of Indians inhabiting western Bolivia. The soil here is rich, growing vanilla, indigo, cotton, sugar, &c.; but for want of markets there is little cultivation. The policy of the Jesuit missionaries has made the Chiquito language the predominant one among the natives. It is copious, and is said to have a separate vocabulary for female use. The native population is about 22,000, distributed among ten missions. The size and decorations of the churches, and the perfection of the church music, in which the natives take a part, are a curious monument of the perseverance of the Jesuit missionaries, which has succeeded in rearing in the midst of these solitudes a fragment of European civilization almost purely artificial.

CHIRAGRA (Greek, from *cheir*, the hand, and *agra*, a seizure), that species of arthritis, or gout, which attacks the joints of the hand (the wrist and knuckles) and hinders their motions. It gradually deprives the hands of their flexibility, and bends the fingers, distorts them, and impedes their action by the accumulation of a calcareous matter.

CHIRATA, CHIRETTA, *Ophelia Chirata*, a slender branching annual of the gentian family, 2 to 3 feet high, with yellow flowers. It is a native of India, where the dried stems are in repute as a tonic and febrifuge both with native and European practitioners.

CHIROMANCY. See CHEIROMANCY.

CHIRON, in Greek mythology the son of Kronos (Saturn) and Philyra. Kronos assumed the shape of a horse, in this amour, to deceive his wife Rhea. The shape of Chiron, therefore, was half that of a man, half of a horse. In point of fact, Chiron was one of the people called *Centaurs*. He was celebrated through all Greece for his wisdom and acquirements; and the greatest princes and heroes of the time were represented as his pupils. He was particularly skilled in surgery. When Hercules drove the Centaurs from Mount Pelion, they took refuge with Chiron in Malea; but their enemy pursued them even into this retreat, and unfortunately wounded his old teacher with a misdirected arrow. The speedy operation of the poison in which the arrow had been dipped rendered remedies useless; and Chiron suffered the severest torments. The gods at his prayer put an end to his life, though his nature was immortal by reason of his descent from Kronos. After his death he was placed among the stars, and became the constellation Sagittarius.

CHISLEHURST, a parish and village of England, in W. Kent, with an ancient parish church, two district churches, R. Catholic church, &c. The mansion of Camden Place was occupied by Napoleon III. and the Empress Eugénie, and the former died here in 1873. There is a Runic cross in memory of the Prince Imperial Pop. in 1901, 7429.

CHISLEU, the ninth month of the Jewish year, commencing with the new moon in December, or the latter part of November. The modern Jews fast on the sixth day of this month.

CHISWICK, a town and parish of England, in Middlesex, 6 miles W. of Hyde Park Corner, London. It has an ancient church, with Hogarth's tomb in the churchyard, and several schools, contains the gardens of the Royal Horticultural Society, and Chiswick House, in which Fox and Canning died. There are engineering works, breweries, market-gardens, &c. Pop. of urban sanitary district in 1891, 21,963; in 1901, 29,809.

CHITALDRUG, or Chitteldroog (native, *Sitala Durga*, spotted castle), a town and fortress, capital of a district of the same name in the Nagar division of Mysore, India. The town is 126 miles N.W. of Bangalore, and the fortress, occupying a cluster of rocky hills about 800 feet high, consists of a labyrinth of fortifications winding irregularly up from rock to rock to the summit, and guarding every accessible point. Inside the fortifications are a number of temples. The modern town stands at the north-eastern base of the hills, and has a population (1891) of 4946. The district has an area of 3994 square miles, and a pop. (1891), of 413,984.

CHITIN, the chief tissue-forming ingredient of the wing-cases of insects, and the shells of crabs and other crustaceans. From these sources it can be obtained by successive treatment with different solvents to remove inorganic matter, fat, &c. When pure it is amorphous, colourless, and semi-transparent, often retaining the form of the original substance. It is insoluble in all ordinary solvents, but by continuous digestion with dilute sulphuric acid it is gradually converted into grape-sugar, the nitrogen forming ammonia. Nothing is known about the physiological transformations of chitin.

CHITON, a genus of molluscs, forming the type of the Chitonidæ, which is the only family of the order Polyplacophora. They are regarded as anomalous gastropods, from which they differ chiefly in their symmetrical form. The shell consists of eight pieces successively overlapping on the back, and connected round the sides by the margin of the mantle. Chitons cling to rocks on the sea-coast in the same manner as limpets, some of them being found beneath the surface of the water. The commonest species is *Chiton squamosus*.

CHITOR, or Chittore, a town and fort of Hindustan, in the native state of Oodeypore, Rajputana, on the Gamneri river, about 70 miles N.E. of the town of Oodeypore. The town was for several centuries capital of Oodeypore, and was far more prosperous and wealthy than it is at present. It still contains many temples and other well-constructed buildings. The fort, formerly considered one of the strongest in India, stands upon a high rock overlooking the town Pop. (1891), 10,286.

CHITRAL, a native state of British India, having Yasin and Gilgit on the E., Swat, Dir, and Bajaur on the S., Kafiristan on the S.W., and the Hindu Kush mountains on the N. and N.W. Through it flows in a S.W. direction the Chitral or Kunar or Kashkar river, a tributary of the Kabul, and on it, in about lat. 36° N., stands the town of Chitral at a height of more than 5000 feet above sea-level. In 1893 the country came under British control in consequence of internal confusion following the death of the ruler, but two years later the murder of his successor by a younger brother, who showed strongly anti-British inclinations, again called for the intervention of Great Britain. After a brilliant campaign the usurper was replaced by a friendly ruler, and a more effectual control was established over the country. The people formerly trafficked in slaves, but this is now forbidden. The climate is excellent, and the vale drained by the river extremely fertile. Pop. about 200,000.

CHITTAGONG, a division, district, and town of India, in the presidency of Bengal, Hindustan. The district has Tipperah on the N., the Chittagong Hill Tracts on the E., Arracan on the S., and the Bay of Bengal on the W. Area, 2563 square miles; pop. in 1891, 1,290,167. The Mugh Mountains traverse the district centrally from north to south, and in the Blue Mountains, in the N.E., attain the height of 5600 feet. The principal river is the Karnaphuli or Chittagong. The level lands, chiefly on the coast and the valleys, are very fertile, yielding large crops with little labour. The principal exports are timber, canvas, coarse cloths, and elephants. On the sea-coast the government has a manufactory of salt. A considerable majority of the inhabitants are Mohammedans. The division also includes the districts of Chittagong Hill Tracts, Noakhali, and Tipperah. Area, 12,118 square miles; pop. 4,190,081.—The town of Chittagong, situated on the right bank of the Karnaphuli, 12 miles from its mouth and 220 miles east of Calcutta, is the second port of Bengal. It consists of a series of detached houses on little hills, and is subject to malaria. The exports are of great importance, and comprise rice, jute, jute manufactures, and tea. Pop. (1891), 24,069.

CHITTELDROOG. See Chitaldrug.

CHITTOOR, or Chittur, a town of India, cap. of N. Arcot dist., Madras. It contains courts and public offices, English church and Roman Catholic chapel, &c. Pop. (1891), 9965.—There is a town of same name in the state of Cochin, Madras. Pop. 10,400.

CHITTORE. See Chitor.

CHITTY, Joseph, a distinguished special pleader, born in 1776, has acquired great reputation as a writer of legal text-books. These comprise a Treatise on Bills of Exchange (1799); Treatise on the Parties to Actions and to Pleadings (1808); Treatise on the Law of Nations relative to the Legal Effects of War on the Commerce of Belligerents and Neutrals (1812); A Practical Treatise on the Criminal Law, adapted to the Use of the Profession, Magistrates, and Private Gentlemen (1816); a Treatise on Commercial Law (1818); a Collection of the Statutes of Practical Utility (1829-37); a Treatise on Medical Jurisprudence (1834). He died in 1841.

CHIUSI (the *Camars* of the Etruscans and *Clusium* of the Romans), a town of Italy, in the province of Sienna, on a hill about 3 miles W. of the lake of same name, and 43 miles S. from Arezzo. Chiusi was one of the twelve confederated towns of Etruria, and the residence of Porsenna. It was ruined in the middle ages by the accumulation of the waters of the Chiana, which converted its territory into a pestilential marsh. It is the see of a bishop, and numerous Etruscan relics have been found near it. Pop. 5000.

CHIVALRY (French *chevalerie*, from *cheval*, Latin, *caballus*, a horse), a term which indicates strictly the organization of knighthood as it existed in the middle ages, and in a general sense the spirit and aims which distinguished the knights of those times. The chief characteristics of the chivalric ages were a warlike spirit, a lofty devotion to the female sex, a love of adventure, and thirst for glory.

To explain the nature and origin of chivalry we must consider the character of the ancient German tribes. The warlike spirit was common to them with other barbarous nations; but there were certain traits in their character peculiarly their own. Among these was their esteem for women. This is dwelt upon by Tacitus, and is sufficiently apparent from the early native German historians. This regard for the female sex was diffused by them through every country into which they spread, though with considerable difference in the forms in which it developed itself. In France it became that refined gallantry for which the nation has been so long conspicuous; in Spain it assumed a more romantic and glowing character, displaying much of the fire of oriental feeling; in Germany itself it became faithful and tender attachment to the wedded wife. Undoubtedly the Christian religion assisted in developing this feeling of esteem for the female sex in those times, and it has been alleged that the adoration of the Virgin, which afterwards began to be superstitiously taught as a part of it, and to be as superstitiously acted upon by its professors, may have tended, by keeping a deified image of chastity before the mind, to produce the same result. The allegation is more plausible than true. Indeed the inefficacy of this superstitious feeling is proved by the case of several Asiatic nations, which, though worshipping gods fabled to be the offspring of female births, keep their women in a very degraded condition, treating them as if they formed an inferior portion of human nature, and were entitled to none of its distinguishing privileges. We may be told, in answer to our claim of the peculiar regard for the female as a characteristic of the Teutonic tribes, that women were held in high esteem by the Romans. It is true that wives and mothers were treated with great regard by the Romans, and the history of no nation affords more numerous instances of female nobleness; but this esteem was rendered to them, not as females, but as the faithful companions and patriotic mothers of citizens. It had somewhat of a political cast. But this was not the case with the Germans. There is another trait of the German character which deserves to be considered in this connection, which is very apparent in their literature, and the lives of many individuals; we mean that indefinite thirst for something superior to the realities of life, that *sehnen*, to use their own word, which hardly admits of translation, which has produced among them at the same time so much excellence and so much extravagance. These three traits of the Teutonic race, their warlike spirit, their esteem for women, and their indefinable thirst for superhuman greatness, together with the influence of the feudal system and of the Roman Catholic religion, afford an explanation of the spirit of chivalry—an institution which, to many observers, appears like an isolated phenomenon in history, and leaves them in doubt whether to despise it as foolish, or admire it as sublime. The feudal system divided the Christian Teutonic tribes into masses, the members of which were united, indeed, by some political ties, but had little of that intimate connection which bound men together in the communities of antiquity, and which has produced like effects in our own and a few preceding ages. They still preserved, in a great measure, the independence of barbarians. There was, however, one strong bond of union which gave consistency to the whole aggregate; we mean the Roman Catholic religion, which has lost much of its connecting power, in proportion as other ties, chiefly those of a common civilization, have gained strength. The influence of a common religion was of great service to mankind during the ages of ignorance and violence, in giving coherency to the links of the social chain, which were continually in danger of parting. To this cause is to be ascribed the great uniformity of character which prevailed during the ages of chivalry. The feudal system, besides, enabled the gentry to live on the labours of the oppressed peasants, without the necessity of providing for their own support, and to indulge the love of adventures incident to their warlike and ambitious character. If we now combine the characteristics which we have been considering —a warlike spirit, a lofty devotion to the female sex, an undefinable thirst for glory, connected with feudal independence, elevation above the drudgery of daily toil, and a uniformity of character and purpose, inspired by the influence of a common religion—we obtain a tolerable view of the chivalric character. This character had not yet quite developed itself in the age of Charlemagne. The courage exhibited by the warriors of his age was rather the courage of individuals in bodies. The independence, the individuality of character, which distinguished the errant knight who sought far and wide for adventures to be achieved by his single arm, was the growth of a later period. The use of the war-horse, which formed so essential an instrument of the son of chivalry, was not common among the Germans until the time of their wars with the Huns. They were indeed acquainted with it before, and Tacitus mentions it in his account of Germany; but it was not in common use among them till the period we have mentioned. After it was introduced, cavalry was considered among them, as among all nations in the early stages of their progress, much superior to infantry, which was, in fact, despised, until the successes of the Swiss demonstrated its superiority. In the eleventh century knighthood had become an established and well-defined institution; but it was not till the fourteenth that its honours were confined exclusively to the nobility. The Crusades gave a more religious turn to the spirit of chivalry, and made the knights of all Christian nations known to each other, so that a great uniformity is thenceforward to be perceived among them throughout Europe. Then arose the religious orders of knights, the knights of St. John, the Templars, the Teutonic knights, &c. The whole establishment of knighthood assumed continually a more formal character, and degenerating, like every human institution, sank at last into Quixotic extravagances, or frittered away its spirit amid the forms and punctilios springing from the pride and the distinctions of the privileged orders of society. It merged, in fact, among the abuses which it has been one of the great labours of our age to overthrow. The decline of chivalry might be traced through the different forms which it assumed in different nations as distinctly as its development—a task too extensive for this work.

The education of a knight was briefly as follows: —The young and noble stripling, generally about his twelfth year, was sent to the court of some baron or noble knight, where he spent his time chiefly in attending on the ladies, and acquiring skill in the use of arms, in riding, &c. This duty of waiting about the persons of the ladies became, in the sequel, as injurious to the morals of the page as it may have been salutary in the beginning. When advancing age and experience in the use of arms had qualified the page for war, he became an *escuyer* (esquire or squire). This word is generally supposed to be derived from *escu* or *scudo* (shield, *scutum*), because among other offices it was the squire's business to carry the shield of the knight whom he served. The third and highest rank of chivalry was that of knighthood, which was not conferred before the twenty-first year, except in the case of distinguished birth or great achievements. The individual prepared himself by confessing, fasting, &c.; religious rites were performed; and then, after promising to be faithful, to protect ladies and orphans, never to lie nor utter slander, to live in harmony with his equals, &c. (in France there were twenty vows of knighthood), he received the *accolade*, a slight blow on the neck with the flat of the sword from the person who dubbed him a knight, who at the same time pronounced a formula to this effect: 'I dub thee knight, in the name of God and St. Michael (or in the name of the Father, Son, and Holy Ghost). Be faithful, bold, and fortunate.'

This was often done on the eve of battle, to stimulate the new knight to deeds of valour, or after the combat, to reward signal bravery.

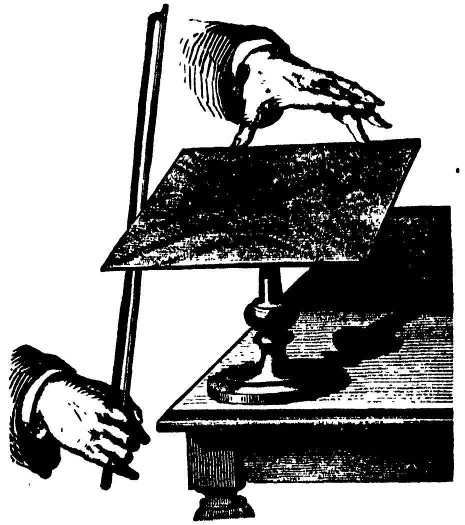
Though no man of any reflection would wish for the return of the age of chivalry, yet we must remember that chivalry exercised, in some respects, a salutary influence at a time when governments were unsettled and laws little regarded. Though chivalry often carried the feelings of love and honour to a fanatical excess, yet the reverence paid to them contributed to prevent mankind, at this period of lawless violence, from relapsing into barbarism; and as the feudal system was unavoidable, it is well that its evils were somewhat alleviated by the spirit of chivalry. The influence which chivalry had on poetry was very great. The *troubadours* in the south of France, the *trouvères* in the north of the same country, the *minstrels* in Britain, the *Minnesinger* in Germany, sang the achievements of the knights who received them hospitably, In Provence arose the *Courts of Love* (which see), which decided the poetical contests of the knights. At these, amorous songs (*chansons*), duets (*tensons*), pastoral songs (*pastourelles*), and poetical colloquies (*sirventes*), were performed. In Germany the chivalric spirit produced one of the most noble epics, the Nibelungenlied (which see). It was the spirit of chivalry which led to the Crusades, and from the intercourse with the East which grew up during this period, the wonders of oriental enchantment were introduced into the romantic or chivalric poetry, and European literature received a great stimulus. Chivalric poetry, however, existed apart from any influence of this kind, and really begins with the mythological cyclus of King Arthur's round table and the feats of his knights, which furnished materials that found poetic treatment in various European countries. A second cyclus is that of Charlemagne and his paladins, his twelve peers, which remained a poetical foundation of chivalric poetry for many centuries. Alexander the Great also became a great hero of chivalric poetry. The cyclus of Amadis, which belongs, perhaps, exclusively to Spain, does not rest on any historical ground. For further information see the essay on Chivalry, originally in the Encyclopædia Britannica, written by Sir Walter Scott; Heeren's Essay on the Influence of the Crusades; Mémoires sur l'ancienne Chevalerie, par Lacurne de Sainte-Palaye (Paris, 1826, two vols., with engravings); Gautier's La Chevalerie (1884); Henne am Rhyn's Geschichte des Rittertums (1893); and last but not least, Don Quixote. See also the articles Romance, Middle Ages, Tournament, and other articles in this work connected with this subject.

CHIVASSO, a town of Italy, on the Po, 14 miles N.E. of Turin, was formerly strongly fortified, and contained the residence of the Dukes of Montferrat. Pop. 5446.

CHIVE, or Cive, a small perennial garden plant (*Allium Schœnoprasum*), of the same genus as the onion, leek, garlic, &c., used as a culinary vegetable for flavouring soups, &c. It is a rare native of Britain. The bulbs are small and slender, and the erect, subulate leaves are grouped in tufts.

CHLADNI, Ernst Florens Friedrich, a German physicist, and one of the founders of the science of acoustics, was born at Wittenberg on Nov. 30, 1756, and died at Breslau on April 4, 1827. After a successful course of study at the school of Grimma he adopted the profession of jurisprudence, which he practised first in his native town, and afterwards at Leipzig, where he took the degrees of Doctor in Philosophy and in Law. His natural taste led him to study music, and to devote his leisure to physical science. The backward state of the theory of music compared with the other physical sciences early opened up to him a neglected mine of scientific discovery; and at the age of nineteen he set himself resolutely to investigate it. By covering plates of glass with fine sand, and causing them to vibrate, he discovered the fundamental fact in the science of acoustics, that the communication of vibrations in material bodies is subject to constant mathematical laws. His scientific investigations led him to travel through the principal countries of Europe and visit its principal capitals. He invented the euphone about (1789) and clavicylinder (1800), instruments more curious than useful, in which musical sounds are produced by friction, and by the revolution of a glass cylinder causing the vibration of chords. His scientific works are of quite a different value. The first of them, Entdeckungen über die Theorie des Klanges, appeared in 1787; Acoustics (which he himself translated into French, Paris, 1809), in 1802; Neue Beiträge zur Akustik, 1817; Ueber Feuermeteore, 1820; &c.

CHLADNI'S FIGURES, the figures formed by sand strewn on a metal plate, or even a slip of wood, when it is clamped firmly at one point, so as to be horizontal, and set in vibration by means of a violin-bow. A thin square plate of brass, for instance, fixed at the middle point, and then bowed, exhibits them beautifully. The plate while vibrating divides itself up into portions that correspond to the *nodes* and *ventral segments* of a sounding-string, parts of it vibrating up and down, while certain lines remain fixed. The sand, as long as it is on a vibrating part, is tossed up and down, but on a nodal line it remains at rest. Hence it gradually collects on the nodal lines, and forms itself into the figures known under the above name. With a uniform plate beautiful symmetrical figures are formed, of which the accompanying diagram will give some idea. They vary in form, and their complication increases as the note that the plate sounds becomes higher and higher. The positions of the nodes may be determined by pressing the fingers on points at the edge of the plate, or pressing down a penknife or other pointed instrument on points in the surface of it, and at the same time bowing it at properly chosen points and with a proper degree of force.



CHLORAL (C_2HCl_3O) seems to be aldehyde, in which chlorine has been substituted for hydrogen (see Aldehyde). It was discovered by Liebig in 1832, who got it by passing dry chlorine gas through absolute alcohol till all action ceased. The quantity of chlorine required for 1 lb. of spirit is nearly 40 cubic feet, and the action must be continued for some days. A very large bulk of hydrochloric acid is evolved at the same time, and this must be got rid by means of a good draught. The crude product is agitated with four or five times its bulk of sulphuric acid, allowed to stand, and the layer of chloral which forms drawn off. It is then rectified over finely divided lime. These operations have in general to be repeated several times to get the chloral quite pure. Chloral is an oily liquid, which boils about 201° Fahr. It has a pungent odour and slightly astringent taste. The vapour acts strongly on the skin. It has a specific gravity of 1·5. When dropped into water it falls to the bottom in oily drops, which dissolve on heating; it is readily soluble in alcohol and ether, and it acts itself as a solvent of iodine, sulphur, and phosphorus.

When brought in contact with a little water, chloral combines with it, forming a hydrate C_2HCl_3O, H_2O, which is white and crystalline, and dissolves on addition of water. When preserved in a stoppered bottle the hydrate sublimes; when heated, it volatilizes without decomposition. Kept in contact with oil of vitriol for a considerable time, chloral passes into an insoluble state, but by heat it again becomes soluble. It is decomposed by alkalies, chloroform being one of the products.

For a number of years chloral was a body of no particular interest to anyone but a chemist, but the discovery of its physiological effects by Dr. O. Liebreich in 1869 soon engaged the attention of the whole medical profession, and chloral (or rather chloral hydrate) has since been very extensively employed in medicine. When it is given internally in doses of 20 grains or thereby it quickly induces sleep of a natural and refreshing character, the awakening from which is unattended by the headache, sickness, confusion, or feeling of stupidity that usually follows sleep procured by opium. In larger doses the sleep is deeper and more prolonged, the person can with difficulty be awakened from it, pain is abolished, breathing becomes slow and shallow, and the pulse, quickened at first, is afterwards slowed; the pupils are much contracted, and there is complete muscular relaxation. The result of poisonous doses is a great fall in bodily heat and paralysis of the heart. Death by chloral poisoning has been prevented by means which maintain the bodily heat, and the treatment of chloral poisoning consists in the use of warm blankets, hot bottles, hot stimulants such as hot coffee, hot toddy, &c. The taste for chloral hydrate is apt to grow upon a person so that its use cannot readily be given up. With constant use larger doses require to be taken, and persons who are accustomed to its use are very apt some day, owing to their familiarity with the drug, to take an over-dose, a very slight increase of an accustomed dose being sometimes sufficient to cause death. Chloral hydrate is chiefly used to procure sleep when a person is suffering from nervous excitement, overstrain or worry, feverishness, delirium, and delirium tremens. It is not nearly so useful for the relief of pain, and is useless for relieving neuralgia. It acts as an antidote to strychnine.

CHLORIC ACID. See Chlorine.

CHLORIDE OF LIME. See Chlorine.

CHLORIDE OF NITROGEN. See Chlorine.

CHLORIMETRY, the estimation of the amount of chlorine in a solution or powder available for bleaching. It has been found necessary to contrive special methods to determine this, because the estimation of the total chlorine present is no guide to the bleaching value of the substance. The methods used are all based on the power chlorine has of decomposing water and thereby liberating oxygen. This is usually done in presence of some body which can combine with the oxygen, so that the whole action is in reality an oxidation. Many methods have been proposed, but one of the oldest, first introduced by Gay-Lussac, is still one of the best. It depends on the conversion of an arsenious into an arsenic compound, the point where the action is completed being indicated by a separate test. A weighed quantity of arsenious acid is dissolved in caustic soda, the solution rendered strongly acid, and the whole diluted to a certain bulk. The arsenious compound requires of course a definite amount of chlorine to convert it to the higher state. Measuring off a convenient bulk of this standard solution, a weighed quantity of the bleaching-powder is beaten to a paste with water, made up to a given strength, and then this diluted solution is run from a graduated glass vessel into the measured quantity of arsenious acid. The action immediately takes place, but as the fluid itself gives no indication of the completion of the change, indigo is added at the commencement of the operation. Then so long as arsenious acid remains the solution continues blue; but when the conversion is complete, the blue of the indigo is immediately bleached, and the solution becoming colourless shows that the bleaching solution is now in excess, and no more is to be added. The number of measures being read off gives the quantity of chlorine required to oxidize the weight of arsenic taken, and from that can be easily calculated the amount of available chlorine in the sample. The performance of this analysis requires some practice, but it is easy of execution, and gives very good results.

CHLORINE. The discovery of this gas was made in 1774 by Scheele, who named it *dephlogisticated marine acid*. The term *dephlogisticated* had exactly the same import as that of *oxygenated*, soon afterwards introduced by Lavoisier. It was afterwards proved by Davy to be not a compound with oxygen, but a simple body, and from its peculiar yellowish-green colour the appellation of *chlorine* (from Greek *chlōros*, green) was given to it. Chlorine gas is obtained by mixing concentrated hydrochloric acid contained in a glass flask, with finely-powdered peroxide of manganese. On the application of a moderate heat the gas is evolved, and can be collected either in bottles over warm water in the pneumatic trough, or by simply leading the delivery tube to the bottom of a bottle, and allowing the heavy chlorine to displace the air. The reaction between the peroxide of manganese (MnO_2) and the hydrochloric acid ($4HCl$) consists in the formation of water ($2H_2O$) and manganous chloride ($MnCl_2$) and the consequent liberation of chlorine (Cl_2). The following method is also employed:—Three parts of common salt (chloride of sodium) are intimately mingled with one of the peroxide of manganese, and to this mixture two parts of sulphuric acid diluted with an equal weight of water are added. By the action of sulphuric acid on the chloride, hydrochloric acid is disengaged, which reacts as above explained upon the peroxide of manganese; so that instead of adding hydrochloric acid directly to the manganese, the materials for forming it are employed.

Deacon's process consists in passing a mixture of hydrochloric acid gas and oxygen over tiles soaked in a copper salt, dried and heated to from 700° to 750° Fahr. At this point water is formed and chlorine is liberated; the copper salt appears to be unaffected by the action. Another chemist's process is to act on peroxide of manganese with a mixture of nitric and hydrochloric acids; chlorine is evolved, water and nitrate of manganese are produced, and this last is converted by ignition into peroxide of manganese and peroxide of nitrogen, both of which can be utilized for the decomposition of a fresh quantity of hydrochloric acid. The economic working of the different processes depends to some extent on the utilization of the by-products, and especially of the manganese salt, and several plans for its recovery and conversion into the peroxide have been devised and are used in large works. See MANGANESE.

Chlorine is gaseous at the common atmospheric pressure, but if at the ordinary temperature it be exposed to a pressure of four atmospheres, it condenses to a mobile yellow liquid, which has never been solididified. It is two and a half times heavier than atmospheric air, and 35·5 times heavier than hydrogen. The gas has a yellowish-green colour, and has the most insupportable suffocating odour. When pure it occasions immediate death to an animal immersed in it; but even when largely diluted with common air it cannot be respired with safety. It occasions a severe sense of stricture at the breast, which renders it impossible to make a full inspiration. This feeling continues for a considerable time, and permanently injurious effects have even been produced. Chlorine is somewhat soluble in water, the solution having the colour and odour of the gas. If the solution be cooled, long yellow crystalline needles deposit, consisting of a hydrate of chlorine. This solid body fuses to a yellow oil at the ordinary temperature, which is liquid chlorine. When exposed to sunlight the solution gradually loses its colour, oxygen is liberated, and the water contains hydrochloric acid in solution. The great affinity of chlorine for hydrogen is one of its most characteristic properties, and is exhibited in a number of reactions. If a mixture of equal volumes of hydrogen and chlorine gas be made in the dark and then exposed to diffused daylight, combination takes place; but if it be exposed to direct sunlight, the gases combine at once with an explosion, and produce hydrochloric acid. This is the only compound these substances form with one another, and it is one of the most important of the acids (see HYDROCHLORIC ACID). When a lighted taper is immersed in a jar of chlorine, it burns with a smoky flame; this is due to the combination of the chlorine with the hydrogen only, and the liberation of the carbon. Similarly, when hydrocarbons like turpentine and olefiant gas are mixed with chlorine and a light applied, a ruddy flame with a copious deposition of carbon shows that the hydrogen and chlorine are alone combining. Several of the elements catch fire when immersed in chlorine, for instance, phosphorus, arsenic, antimony, and copper; while others combine with it at a higher temperature, sometimes with vivid combustion, as in the case of potassium. The compounds of chlorine with the other elements are termed chlorides, and next to the oxides they are the most abundant and widely distributed substances in the earth, many of them besides being of great importance for manufactures. Common salt, the chloride of sodium, is the most plentiful of all, and is met with forming large rock masses in various parts of Europe, and dissolved in the waters of the ocean, of many salt lakes in Asia, America, and elsewhere, and of brine springs. It is the ultimate source of all the hydrochloric acid and chlorine of commerce. Other chlorides, as of potassium, calcium, &c., are met with, but in no case nearly so abundantly as common salt. As a class the metallic chlorides are crystallizable salts, readily soluble in water, some being even deliquescent. The chloride of silver, the subchloride of mercury, and one or two others are, however, insoluble in water, while a few are decomposed by water with the precipitation of an insoluble powder. From its wide affinities and great activity in the free state, chlorine is one of the most useful and powerful instruments with which the chemist deals. By it such metals as platinum and gold are attacked and made soluble in water, while its power over organic substances is very great, and has resulted in the formation not only of a number of compounds by simple union with it, but of a great number into which the chlorine has entered more intimately and produced what are called substitution compounds.

Chlorine is largely consumed in the arts. Thus it is used in the manufacture of potassic chlorate for making lucifer matches; in the conversion of the yellow to the red prussiate of potash, in the preparation of chloride of sulphur for the vulcanizing process, and above all as a bleaching and disinfecting agent This last property is exercised by chlorine, by virtue of its power, already referred to, of decomposing water by combining with the hydrogen and liberating oxygen, which is the true agent in the operation, and which converts the colouring matter into colourless compounds. Berthollet was the first who applied this agency of chlorine to the process of bleaching (which see). The method of using it has been successively improved. It consisted at first in subjecting the thread or cloth to the action of the gas itself; but the effect in this way was unequally produced, and the texture was sometimes injured. It was then applied in a dilute aqueous solution. The thread or cloth was prepared as in the old method of bleaching, by boiling first in water and then in alkaline lye; it was then immersed in the diluted chlorine: this alternate application of alkali and chlorine was continued until the colour was discharged. The offensive suffocating odour of the gas rendered this mode of using it, however, scarcely practicable; but the odour was found to be removed by a weak solution of potash: lime diffused in water, being more economical, was afterwards substituted. Later a compound of chlorine and lime was employed, prepared by exposing slaked lime to chlorine gas: the gas is quickly absorbed by the lime, and the *chloride of lime*, or *bleaching-powder* as it is called, being dissolved in water, forms the bleaching liquor now generally employed. In using it the cloth is first commonly steeped in warm water to clean it, and is then repeatedly washed with an alkaline solution, so diluted that it cannot injure the texture of the cloth; the cloth is then washed and steeped in a very weak solution of chloride of lime, again washed, acted on by a boiling lye as before, and again steeped in the solution; and these operations are performed alternately several times. The cloth is lastly immersed in very dilute acid, which reacts upon the bleaching-powder and liberates chlorine; this then attacks the colouring matter, and the cloth soon acquires a pure white colour. It is next repeatedly washed with water to remove the last traces of the lime salts, and then it is exposed to the action of a hyposulphite in order to render any chlorine inoperative that may remain. The cloth is finally washed, dried, and dressed. When sulphuric acid is used to liberate the chlorine it is found more difficult in the subsequent washing to remove the calcic sulphate formed on account of its sparing solubility in water. To avoid this chloride of magnesia has been substituted for the chloride of lime. It is easily prepared by adding sulphate of magnesium to a solution of chloride of lime and straining off the clear fluid. It has the same bleaching power, is easily removed by washing, and it is said to leave the cloth in a more supple state than when ordinary bleaching solution has been employed. Another important application of chlorine gas and of bleaching-powder is to the destroying or neutralizing of contagion. Acid vapours, sulphurous acid in particular, under the form of the fumes of burning sulphur, is often employed for that purpose; but chlorine, from the facility with which it decomposes the different compound gases that contain the elements of vegetable and animal matter, and which may be supposed to constitute noxious effluvia, is superior to any other agent, and is now universally employed for the purposes of fumigation. It can be used to destroy sulphuretted hydrogen, and it has been found useful among such persons as are obliged to frequent places where contagious effluvia are constantly developed, to bathe the hands and arms with its solution.

The compounds of chlorine with oxygen are of considerable importance. They are all artificial, and can be prepared only by indirect means. They are all somewhat unstable, and some of them decompose readily, even with explosive violence. The known oxides of chlorine are three in number. Two of them are anhydrides; that is, they are capable of combining with water to form acids; there are, besides, other acids, corresponding to oxides, which have not yet been got in the free state. The following table exhibits their composition and relations:—

Hypochlorous anhydride,	Cl_2O	Hypochlorous acid,	$HClO$
Chlorous anhydride,	Cl_2O_3	Chlorous acid,	$HClO_2$
Chloric peroxide,	Cl_2O_4	No corresponding acid.	
Chloric anhydride, hypothetical, unknown,	Cl_2O_5	Chloric acid,	$HClO_3$
Perchloric anhydride, hypothetical, unknown,	Cl_2O_7	Perchloric acid,	$HClO_4$

The hypochlorous anhydride (or oxide, as it is sometimes called) is a heavy yellowish gas, with a peculiar smell. By a sufficiently low temperature it condenses to a deep red liquid. Both the gas and the liquid are liable to explode. By solution in water hypochlorous acid is formed, which is distinguished by its yellow colour and peculiar sweet smell. The acid is very unstable, and is a powerful bleaching agent, in fact, bleaching-powder, according to some, contains hypochlorite of calcium, and it is in consequence of the acid being liberated that the oxidizing and bleaching effect is produced. Chlorous anhydride is a greenish yellow gas, and the acid is a liquid of the same colour. They are powerful oxidizing agents. The peroxide of chlorine is a deep yellow heavy gas, with a powerful odour, so explosive that it is not safe to work with any but the smallest quantities. It is a powerful supporter of combustion; so that phosphorus burns when in contact with it, even if under water. Chloric acid is obtained by decomposing potassic chlorate with hydrofluosilicic acid. Sulphuric acid cannot be employed, as the peroxide may be produced. By decanting from the precipitate and evaporating, a syrupy solution of the acid is obtained. It is a colourless strongly acid fluid with a strong smell. It is decomposed at high temperatures, but it is not stable even at the common temperature. It is a powerful oxidizing agent, and at once destroys organic matter when brought in contact with it. Perchloric acid is a colourless liquid, which remains so even at —31° Fahr. (or 63° below the freezing-point of water). It cannot be preserved, however, for after a time it explodes. When brought in contact with organic matter, the acid decomposes with the greatest violence. These acids by combining with bases form the hypochlorites, chlorites, chlorates, and perchlorates respectively. The more important of these are mentioned in connection with the metals. Chlorine combines with nitrogen. By passing chlorine gas into a solution of sal-ammoniac, oily drops are formed which sink to the bottom, and consist of a compound of the two elements. It is perhaps the most explosive substance known. See NITROGEN.

Chlorine forms four compounds with carbon, represented by the formulæ, CCl_4, C_2Cl_2, C_2Cl_4, C_2Cl_6. The union can be effected only indirectly by decomposition of hydrocarbons. Part of the chlorine combines with the hydrogen, and simultaneously another part combines with the carbon. See MARSH GAS and OLEFIANT GAS.

Chlorine forms important compounds with sulphur, phosphorus, and other non-metallic elements. These as well as the more important metallic chlorides will be found under the respective titles.

CHLORIS, the name of—1. The goddess of flowers and the wife of Zephyrus, identical with the Flora of the Romans.—2. The daughter of the Orchomenian Amphion, the wife of Neleus and the mother of Nestor.—3. The daughter of the Theban Amphion and of Niobe. When the children of Niobe were killed she alone escaped along with Amyclas, and became so pale from terror that her former name of Meliboea was exchanged for that of Chloris.

CHLORITE, an abundant mineral, of which several varieties are distinguished. It gets its name from its dark-green colour, but the crystalline varieties are sometimes *dichroic*. It crystallizes in short six-sided prisms, but it also occurs compact and amorphous. It is very soft, and has a greasy feeling. Its specific gravity is 2·8. It is a hydrated silicate of magnesium and aluminium, sometimes with notable quantities of iron. It is found in Cornwall, in Cumberland, at Portsoy in Scotland, and other localities.

Chlorite schist is a rock of a dark-green colour, due to the presence of the mineral. It is related to the micaceous and talcose schists.

CHLOROFORM ($CHCl_3$) was discovered by Soubeiran in 1831, and independently by Liebig in 1832. Dumas in 1834 established its formula, and on account of its relationship to formic acid, gave it its name. It has been the subject of a great many researches, and many methods for preparing it have been devised. Liebig obtained it from chloral by a reaction which has since become of the greatest interest. (See CHLORAL.) The method which is employed for the preparation of the compound on the large scale consists in distilling a mixture of bleaching-powder diffused in water, slaked lime, and alcohol. The crude product is well washed with water, the chloroform agitated with sulphuric acid, and rectified. Alcohol, ether, and several oils produced during the reaction are the chief impurities, and some of these are difficult to remove. Impure chloroform is characterized by a number of tests, by its odour, and by its deportment with different reagents. When quite pure, it is a colourless oily liquid with an agreeable odour and sweet taste. Its vapour has also a sweet taste. It boils at 140° Fahr. It has a specific gravity of 1·5. It is sparingly soluble in water, mixes freely with alcohol and ether, oil of turpentine, and other fluids. It is not acted on by ordinary chemical reagents, such as the alkalies, and nitric and hydrochloric acids, but it is decomposed by exposure to air and light, and when exposed to a red heat. Chloroform is a very valuable solvent for resin, wax, alkaloids, for sulphur, phosphorus, iodine, and similar substances, which are sparingly soluble in ordinary fluids.

But its chief use is in medecine as an anodyne and anæsthetic. It was introduced in medicine by the late Sir J. Y. Simpson in 1847, to assuage or rather destroy pain, more especially during the performance of surgical operations, by throwing the patient into a state of temporary insensibility. The inhalation of ether had previously been much employed for the same purpose, but not always with the happiest results; and the substitution of chloroform, by which the use of ether has been altogether supplanted, is now universally admitted to have been a most important improvement. It is much more prompt in its action and permanent in its effect, has a pleasing rather than an offensive smell, does not act upon the glottis so as to produce the troublesome cough caused by the vapours of ether, is far less exciting to the patient, and in the great majority of cases, after bestowing the benefit, has not counterbalanced it by ulterior consequences. The vapours of chloroform may be breathed without any complicated apparatus from a napkin or a sponge, the latter preferably, because being more retentive of the fluid it allows the vapours to escape more gradually, and thus furnishes a better means of regulating the quantity to be administered. In some cases, more especially when the liquid is perfectly free from adulteration, the soporific effect is produced almost instantaneously. A substance so potent requires of course to be used with extreme caution. When given in excess the face assumes a deadly paleness, the pulse becomes imperceptible, the skin grows cold, the breathing declines and threatens to become extinct. In some such cases these appearances have become realities, and the patient has actually expired. But when sufficient precaution is used the insensibility produced has no bad results, and operations which would otherwise be most excruciating are performed without the slightest feeling of pain. The flesh often seems to shudder, and even sighs or cries may be uttered, but these are merely nervous or instinctive manifestations, not indicative of true sensation. Chloroform is not confined to surgical operations, but has been employed with success for mitigating actual pain of any description, as toothache and other kinds of neuralgia, parturition, &c. The application of it has suddenly stopped an attack of epilepsy, and cured tetanous convulsions after opium has proved ineffectual. It is also used with good effect in the reduction of fractures and dislocations, as well as hernias. The last indeed have sometimes disappeared spontaneously without any other remedy than the sedative agency of chloroform.

CHLOROPHANE. See FLUOR.

CHLOROPHYLL. See COLOURING MATTERS.

CHLOROPHYLLITE, a variety of the mineral iolite or cordierite, which has derived its name from its greenish-brown colour and leaf-like appearance. It is a silicate of aluminum, magnesium, and iron, like iolite, but contains water in addition. It is found in the United States, in the States of Maine and Connecticut, in large prisms. It is very soft and brittle, is translucent, and has a specific gravity of 2·7.

CHLOROSIS (Greek, *chlōros*, green), or GREEN SICKNESS, a disease specially affecting young girls, is characterized by a greenish or yellowish hue of the skin, languor, indigestion and general debility, and derangement of the system. When unconnected with any disease of the heart or lungs, and attended to in time, it is not a dangerous ailment. The pathological condition of chlorosis is a diminution in quantity of the red globules of the blood, the important constituent of which is iron, and accordingly the administration of iron forms a leading part of the treatment of this disease. It is much more apt to attack young women residing in cities, where they lead a sedentary and artificial existence, than those breathing the purer atmosphere of the country, and spending much of their time in the open air. Much of the efficacy of the cure, therefore, depends upon the patient herself, who should be recommended change of air and scene, a wholesome nourishing diet, and a proper amount of exercise, with abstinence from excessive mental or bodily labour.

CHOCKS are pieces of wood employed on shipboard as wedges to support various articles liable to be displaced by the motion of the vessel. They receive different names according to the purposes for which they are used, as *anchor-chocks* to support the anchor, *rudder-chocks* to keep the rudder immovable in the event of accident rendering it unmanageable. Chocks are also used to support casks, boats, and other curved objects.

CHOCOLATE. See CACAO.

CHOCZIM (properly KHOTIN), a fortified town of Russia, on the right bank of the Dniester, opposite to Kaminiec, in Bessarabia. The Turks caused Choczim to be regularly fortified, in 1718, by French engineers; but it was taken by the Russians in 1730, 1769, and 1788. As it is completely commanded by the hills which surround it, its value as a fortress is now small. Its chief importance is as a military station. Pop. 15,782.

CHŒRILUS, the name of several Greek poets, among whom Chœrilus of Samos is the best known. He lived in the fifth century B.C., was the contemporary and friend of Herodotus, and composed an epic poem, entitled Persica, celebrating the victory of the Greeks over Xerxes. The fragments of the poem still extant have been collected and explained by Näke (Leipzig, 1817). Another Chœrilus, of Iasus, in Caria, is mentioned by Horace, but does not appear to have possessed much poetical talent. He formed part of the train of literary men who accompanied Alexander the Great on his expedition to the East.

CHOIR, that part of the church where the choristers sing. In some old churches the seats of the choristers and other parts of the choir are ornamented with admirable carved work. See Gothic Style in article ARCHITECTURE.

CHOISEUL, the name of an ancient French family which has furnished a great number of distinguished individuals. One of the best known is Etienne François, duke of Choiseul Amboise, who was born in 1719, entered the army in early life, and after distinguishing himself on various occasions in the Austrian war of Succession, returned to Paris, where he soon rose to the highest honours. His marriage with the daughter of the financier, Crozat, gave him the command of great wealth, and his intimacy with Madame de Pompadour furnished the means of gratifying his ambition. After having been ambassador at Rome, in which capacity he obtained from the pope, Benedict XIV., the celebrated encyclical letter intended to appease the disputes which had arisen on the bull Unigenitus, and at Vienna, where he concluded with Maria Theresa the treaty of alliance against Prussia, he became in 1758 minister of foreign affairs. At the same time he was made a duke. He succeded the Marshal of Belle-Isle as minister of war in 1761, and the same year he became also minister of marine. His administration was distinguished by many useful reforms. He reorganized the army and navy, which the disasters of previous wars and the neglect of previous administrations had suffered to fall into decay; negotiated the famous Family Compact which re-united the various members of the Bourbon family, and restored Corsica to France. His fall was brought about in 1770 by a court intrigue, supported by Madame du Barry, the new favourite of the king. He was banished to his estates. He was recalled to court on the accession of Louis XVI. in 1774, but was not again intrusted with power. He was profuse in his expenditure, and though his fortune was large he died overwhelmed with debt in 1785. The memoirs published in his name in 1790 are not considered authentic.

CHOISEUL-GOUFFIER, MARIE GABRIEL, COUNT OF, a celebrated antiquarian, born at Paris in 1752, received a classical education at the College of Harcourt, and early displayed a particular interest in everything relating to Greece. His wish to visit this country was gratified in 1776, and in 1782 appeared the first volume of Voyage Pittoresque en Grèce, which attracted much attention and procured him a seat in the French Academy in 1784. The two other volumes appeared in 1809 and 1820. The first was entirely revised by him before his death. The same year he was appointed ambassador to Constantinople, where he remained till 1791. The appointment of ambassador to London was then offered to him, but as he was opposed to the revolution he remained at Constantinople and sent his official correspondence to the exiled French princes. This correspondence having fallen into the hands of the republicans the convention gave orders for his arrest, but he escaped by taking refuge in St. Petersburg, where the Empress Catherine II. gave him a most flattering reception, and her successor, Paul I., made him a privy-councillor, director of the Academy of Arts, and superintendent of the imperial libraries. He returned to France in 1802 and resumed his seat in the Academy. In 1814 he was made a peer of the realm. His death took place in 1817, at the baths of Aix-la-Chapelle. His antiquarian researches were chiefly inserted in the memoirs of the National Institute, and his very valuable collection of antiquities is now in the museum of the Louvre.

CHOISY-LE-ROI, or CHOISY-SUR-SEINE, a town, France, department of Seine, 7 miles S. of Paris, left bank of the Seine, here crossed by a wooden bridge, with stone piers, and a station on the Paris and Orleans Railway. Its broad straight streets, elegant houses, and fine avenues, with the proximity of the Seine and of the railway, contribute to render it one of the most agreeable towns in the vicinity of Paris. In its cemetery is the tomb of Rouget de l'Isle, author of the Marseillaise. It has manufactures of wax-cloth, soap, chemical stuffs, glass, morocco leather, earthenware, porcelain, and vinegar. There are also some distilleries. It has some trade in wine, vinegar, coal, &c. Pop. (1896), 9516.

CHOKE-DAMP is the name given by miners to carbonic acid gas. See CARBON.

CHOLERA. Cholera is divided into two varieties—*British cholera* and *Asiatic cholera*, or *cholera morbus*. The disease, whether Asiatic or British, commences with a sudden and almost simultaneous attack of vomiting and purging. Diarrhœas prevail during the hot summer months, and are attributed, though not on very definite grounds, partly to the continued heat, partly to sudden coolings at night, to cold drinks, to fruit and salads, &c. This diarrhœa, when severe, is often called British cholera. This so-called British cholera is of a very mild character when compared to cholera morbus, but notwithstanding it is a disease which not unfrequently proves fatal. After the patient has by vomiting and purging emptied the stomach and bowels of their contents, a cessation gradually takes place, and the cure follows in some days. There are, however, exceptional cases of summer cholera so violent as to bring on copious discharges, both upwards and downwards, of a white fluid resembling rice-water, accompanied with blueness of arms and legs, dimness of sight, an imperceptible pulse, and a hoarse voice. The changes last mentioned are the tolerably constant characteristics of a form of cholera which since early in the century, travelling gradually from the East Indies, has spread over all quarters of the globe, and is designated by the name of the *Asiatic* or *oriental cholera*. It has also received other names, as the *travelling*, the *epidemic*, the *contagious cholera*, &c. This disease has its proper home in the East Indies, where, in the course of last century it repeatedly occasioned widely fatal epidemics. In 1817 it began to settle in a virulent form in the neighbourhood of Calcutta, and in the immediately following years extended into other parts of Asia, more especially the islands of the Indian Ocean and China, and then into Persia, always following the caravan routes. Still keeping to these it at last crossed the Russian frontiers, traversed Russia, whence, in a short time after 1831, it visited Poland, Germany, the British Islands, France, Italy, &c., and as early as 1832 made its way to America. In all lands not only has the cholera carried off numberless victims, but it has likewise become endemic, appearing sometimes here, sometimes there, then diffusing itself over a large space and resuming its wanderings. The last it did particularly in 1848 and 1849, at which time it caused the death of over 55,000 persons in England alone. In 1854–55 Europe was again severely scourged by this epidemic, which, however, was less virulent in Britain than before. The next visitation was in 1866, comparatively slight in England but severe in many parts of the Continent, the deaths in Austria being estimated at about 100,000. In the summer of 1883 it appeared in Egypt, and in the space of three months cut off at least 30,000 persons. Next summer it reached the south of France and Italy, and raged severely at Toulon, Marseilles, and Naples. In 1892 some parts of Europe again suffered severely.

The direction that the epidemic takes is for the most part from E. to W. No climate and no kind of weather arrest it. It has prevailed in the tropics with a mean heat of 95° (Fahr.), as well as in the frozen lands of Siberia, with a mean cold of -31°, in winter as in summer. It often, apparently, takes a large leap. Thus, for instance, in 1883 it was supposed to have been carried from India to Egypt, and it reached Paris without lighting on many intermediate places. Now and then it shuns minor districts, especially when mountainous. Many towns and districts which it at one time seems to shun it afterwards attacks. In towns it fixes its seat particularly, and displays its greatest virulence in damp, dirty quarters, and those occupied by the poorer classes. A contagion properly so called—that is, the transmission of the disease from person to person—is not yet scientifically ascertained. A carrying of it from place to place seems, however, to be completely established, as in those instances where it has broken out in any locality on the arrival of a particular ship, or caravan, or body of troops. On the other hand persons who have come out of an infected district are often seized without the disease spreading any further in the district to which they have come.

The primary and essential element in the production of cholera has been ascertained to be a constituent of the excreta of cholera patients. Whether this particular substance is the germ of a fungus or other form of minute life is not quite certain, but that it is an organism capable of propagating itself when it is taken into the alimentary canal is beyond a doubt. When this virus is swallowed it acts by rapidly causing a shedding of the epithelial covering of the mucous membrane. When this takes place the serum of the blood is allowed to drain away from the vessels of the intestines, and at the same time their digestive and absorbing powers are destroyed. It is most worthy of note, however, that although this poison is so active in producing cholera, it is only potent at a certain stage of decomposition. It has been demonstrated that when cholera evacuations are allowed to decompose, after a certain time has elapsed they lose their activity and become inert.

Dr. Koch, who in 1883 made investigations to discover the organism productive of cholera, thought he had detected it in the 'comma' bacillus (so called from its shape); but Dr. Klein, following in the same course, reported in 1885 that he was not able to take this view. See GERM THEORY, in SUPP.

The disease of cholera, or, in other words, the sickness of the individual subject to that epidemic cause, usually takes the following course:—For some days most are affected by disorders of the digestive system, more especially by watery diarrhœas (*cholerine*), through the neglect of which the disease first assumes its more virulent form. Often, however, all such premonitory symptoms are wanting, and the evil appears at once with the suddenness of lightning. The patient vomits once or several times, for the most part in a copious stream, first the contents of the stomach and bile, then a fluid resembling rice-water; next by sudden and rapidly succeeding stools he discharges a large quantity of intestinal contents and water. These at first contain bile, but at last assume the rice-water appearance, or rather that of thin oat gruel. The minute particles producing this grayish muddy appearance prove, when examined by the microscope, to be the fine epithelial cells of the mucous membrane of the bowels, which have scaled off from it in large quantities, somewhat like what takes place in the peeling off of the epidermis in scarlatina or erysipelas. In these discharges are also found fatty globules, corpuscles of blood, tri-phosphate crystals, and often also the fungi of fermentation, and fungus spores, which, however, in part are introduced into the system in what is drunk, and in part are the products of decomposition, though they have been erroneously regarded by some medical men as the causes of cholera. In what is called *dry cholera* (*cholera sicca*), a particularly dangerous form of the disease, but of rare occurrence, the rice-water discharges are entirely wanting, the suddenly paralysed intestinal canal being incapable of expelling the materials collected in it. With the occurrence of the watery discharges, and the accompanying evacuations upwards and downwards, the pulse sinks, the beating of the heart grows feeble, the legs and arms, the nose and ears, become blue or bluish-gray and cold as marble, and the skin wrinkled and unelastic; the face shrinks, particularly about the eyes, which, surrounded by gray or blackish rings, sink deep into their orbits, the voice turns hoarse, the urine ceases, and sharp cramps take place, particularly in the calves of the legs, &c. At last, sometimes during the cessation of the discharges, the pulse, the beating and action of the heart, become entirely imperceptible, and death follows usually with the signs of a complete stoppage of the circulation of the blood, and a paralysis of the nerves (asphyctic cholera). In successful cases there is a gradual return of the warmth of the body, the pulse and beating of the heart, as well as of the urine; consciousness and a desire of life are again felt; the stools again contain bile, become feculent, &c. Often, however, during this reactionary period, a peculiar fever comes on, which, taking a course like that of typhus, has been called *cholera-typhoid*. It lasts a week, and not unfrequently carries off the patient.

On opening the bodies of those who have died of cholera the appearances are principally two—a violent process of exudation in the intestinal canal, and a sudden change of the blood with the accompanying results. In the intestines, and partly also in the stomach, is found that copious fluid resembling rice-water, and consisting of exuded serum and the intestinal epithelia that have scaled off. The mucous membrane of the bowels is inflamed, and often the mesenteric glands are swollen. The blood is of a dark blue-red colour, like that of the bilberry, more or less inspissated, and highly viscous like tar or pitch. It is accumulated in the heart, but, on the contrary, is wanting in the capillary vessels, so that the cellular tissue, the muscles, the lungs, and other parts are found poor in blood, dry, clammy, and unelastic, the skin gray and shrivelled, and the serous membranes adhesive. The kidneys are almost invariably altered, and manifest in severe cases, especially in the cholera-typhoid, that peculiar kind of alteration known by the name of albuminous, which also makes itself known during life by the albuminous contents of the urine, and the retention of urinary matter in the blood. Notwithstanding the light thrown upon the nature of cholera by these indications, and by many others (particularly during the epidemic of 1848–49), very little progress has been made in the mode of treatment. It is known that the epidemic is rendered milder by attention to sufficient dwelling-houses, clothing, bed-clothes, wholesome and sufficient food for the working-classes, by cleanliness and the enforcement of sanitary regulations; and that the individual who during the prevalence of cholera has an attack of diarrhœa (cholerine), by giving immediate attention to it, by strict diet, the maintenance of warmth by bandages, by blisters applied to the stomach, by warm drinks, warming-pans, &c., can in general ward off the disease, while, on the contrary, the neglect of these precautionary measures is almost sure to be followed by a sudden and violent attack of it. The methods of cure recommended and employed are exceedingly various. One applies ice, another hot water; one the cold shower-bath, another vapour-baths; one antiphlogistic, another phlogistic remedies; one astringents, as tannin and nitrate of silver, another diluents, as calomel, rhubarb, &c. Homœopathy, hydropathy, galvanism, &c., have also their followers. The most necessary thing is, when an individual is seized, to bring him forthwith without long transport to the nearest warm bed, and to warm his extremities, as well as his abdomen, with hot bricks, &c.; by favourable positions and propping to lighten the vomiting and purging; and above all to endeavour if possible to keep up his courage.

CHOLESTERIN ($C_{26}H_{44}O$), a white substance which forms beautiful pearly crystalline scales, without taste and odour, insoluble in water; readily soluble in hot alcohol, in ether, and other fluids, from which it crystallizes by cooling or by evaporation. When heated it melts and sublimes. From its behaviour with organic acids it seems to be an alcohol, as with them it forms different compound ethers. It may be prepared from biliary calculi—which sometimes consist of nothing else but cholesterin, along with a little colouring and fatty matter and mucus—by boiling with alcohol and some alkali, filtering and crystallizing. The most abundant source is the fat of greasy wool, and under the name of *lanolin* it is widely used for medicinal purposes, as a component of ointments and salves, and as an ingredient in pomades, cosmetics, &c. For these purposes it is manufactured from wool-oil by adding caustic soda, putting in a centrifugal machine, and afterwards precipitating by means of lime. Cholesterin is essential to the brain and nerve substance, and has been found in the blood, milk, and in many other portions of the body, both as a normal and as a pathological constituent. It has also been found in beans, pease, wheat, rye, and several other plants. Its formation and function in the body, as well as the particular state of combination in which it exists, as, for instance, in the brain, are at present unknown.

Cholesterin was detected last century, but it was first fully investigated by Chevreul, by whom it was named. Since then it has been much studied, especially with regard to its occurrence.

CHOLET, a town, France, department of Maine-et-Loire, on the right bank of the Moine, 32 miles S.W. of Angers. It has a tribunal of commerce, consulting chamber of manufactures, and communal college. A fine dark granite is found in the neighbourhood, and stone quarries are wrought. Manufactures of handkerchiefs and cotton goods, called *cholettes*, flannels, and woollen stuffs. There are also wool and cotton spinning-mills, bleachfields, dyeworks, and tanneries. These industries are extended over an industrial circle of 120 communes, of which Cholet is the centre, and occupy 50,000 to 60,000 workers. There is also a great trade in cattle, the markets for which are attended by a large concourse of buyers from other parts. Pop. (1896), 14,200.

CHOLIAMBUS (Greek, *choliambos*, the lame iambus; also called *skazon*, from *skazo*, to halt; or *versus Hipponacticus*, because the satirist Hipponax of Ephesus made use of it, or perhaps invented it). The choliambus is an iambic trimeter, the last foot of which, instead of being an iambus, is a trochee or spondee, which gives it a lame motion, as, for instance, Martial, l. i. epig. 3:—

Cur in theatrum, Cato severe, venisti?
An ideo tantum veneras, ut exires?

We perceive, from the construction of the choliambus, that it may be applied with advantage to produce a comic effect. The Germans have happily imitated this verse, as well as all other ancient metres. An instance of a German choliambus is—

⏑ — ⏑ — ⏑ — ⏑ — ⏑ — — ⏒
Der Choliambe scheint ein Vers für Kunstrichter.

CHOLIC ACID ($C_{24}H_{40}O_5$). This non-nitrogenous acid does not exist in bile ready formed, but is produced by decomposing the true biliary acids with an alkali. It is crystalline, sparingly soluble in water, readily in alcohol and ether. The cholates are rather obscurely crystalline; they are not very soluble in water, but rather more so in spirit. Both the acid and salts have a bitter taste.

CHOLIN. This base was originally found in pigs' bile, and afterwards in that of the ox. It has been since identified with a body derived from protagon, which exists in the egg-yolk, called neurine. It has also been recently prepared artificially by a process deduced from its rational composition. Cholin is a deliquescent highly alkaline mass, which absorbs carbonic acid from the air. The carbonate does not readily crystallize, but its chloride gives yellow crystalline needles with platinic chloride.

CHOLOCHROME. See COLOURING MATTERS.

CHOLULA, a city, Republic of Mexico, state of and 12 miles W. of La Puebla, 60 miles S. by E. of Mexico. The streets are regular and spacious, the houses mostly of one story, and flat-roofed. Though fallen from the importance it had attained in the early part of the sixteenth century, it still exhibits traces of its former greatness. Under the name of Chunultecol it was once the capital of an independent district, and the seat of the religion of the ancient Mexicans. At that time it contained, it is said, 40,000 houses and more than 400 temples. One of these temples still remains, though in ruins, to which the people resort in crowds at the festival of the Virgin. It is described by Humboldt as being built in the form of a pyramid, of four stories of equal height, in alternate layers of clay and sun-burned bricks; each side of its base measuring 1440 feet, and its height in all 164 feet. At the present day the form is so altered that it looks at a distance like a natural hill. On one of its highest platforms a chapel has been constructed, in the form of a cross, 90 feet long, with two towers and a cupola. Pop. 10,000.

CHONDRIN, a substance containing carbon, hydrogen, nitrogen, oxygen, and sulphur, obtained from rib-cartilage by continuous boiling with water, exhausting with ether to remove fat, and drying. Its composition varies slightly according to the material made use of; it contains about 0·4 per cent. of sulphur. It is a diaphanous horny mass, insoluble in alcohol, but softening and dissolving in hot water. From this solution it is thrown down as a bulky precipitate by acids and by the salts of several heavy metals. By boiling with sulphuric acid it is decomposed into leucine, and with hydrochloric acid into a sugar-like body called chondroglycose. Nothing definite is known about its origin or function in the body. It has a marked general resemblance to gelatine, but it is distinguished by giving the precipitates just mentioned with the acids and salts. Infusion of nut-galls precipitates both.

CHONDROPTERYGII. Under this name were included by Cuvier the sturgeons, sharks, rays, lampreys, mud-fish, and lancelet, an assemblage of fishes so unnatural that the possession of fins and gills sums up nearly all they have in common. The term was adopted to give prominence to what seemed a fact of cardinal importance, namely, that the skeleton of the limbs was cartilaginous. In modern systems the *Amphioxus*, or lancelet, is the sole example of an order —Leptocardii (Müller) or Pharyngobranchii (Huxley) —in which the cranium is purely membranous, and scarcely larger than the spinal canal; the spinal marrow is inclosed in a sheath, with only traces of division into vertebræ; and a heart is wanting, the circulation being maintained by the contractility of the blood-vessels. The glutinous hag (*Myxine*), the river lamprey (*Petromyzon*) and its larva (*Ammocœtes branchialis*), represent the order Cyclostomata, known also as Marsipobranchii, the gills being lodged in pouches. These two groups should, in the opinion of some, form two distinct classes of equal value with the remainder of the fishes, which are divided into the Ganoids, or Ganoidei; the osseous fishes, or Teleostei; the Selachii, including the sharks and rays; and the Dipnoi, represented by the mud-fish (*Lepidosiren*). The last-named group comes under the Chondropterygii of Cuvier, but it is now known to rank very high in the scale among fishes, and to be closely related to the amphibians, or to the reptiles, inasmuch as its heart has two auricles, the other fishes having only one, and true lungs co-exist with gills. Again, while the skeleton of the sturgeon is nearly wholly cartilaginous that of the other ganoids is well ossified, while the structure of the heart and sense organs removes the Selachii very far from the lancelet and the cyclostomatous fishes. The cartilaginous or embryonic condition of the skeleton may persist through life among the fishes in association with the highest as well as the lowest development in other respects. The Cuvierian group is therefore now distributed according to the sum of the characters, and the fishes included in it are not massed together simply because one point of structure is common to all.

CHOPIN, a Scotch liquid measure containing 2 imperial pints. The chopin, in name at least, was derived from the French, with whom a similar measure was in use till the introduction of the metric system. The French *chopine* was not a uniform measure, but varied according to localities. That of Paris was a little over four-fifths of an imperial pint.

CHOPIN, Frédéric François, a celebrated musical composer, was born near Warsaw on March 1st, 1809, his father being a Frenchman engaged in teaching. After studying music in Warsaw he travelled through various cities of Germany and Austria, and finally settled in Paris in 1831. Here he became celebrated as a virtuoso and composer, and made the acquaintance of Liszt, George Sand, Berlioz, and other well-known persons. His health began to decline about 1840, and on Oct. 17, 1849, he died. On two occasions, namely, in 1837 and in 1848, he visited England, and in the latter year he also played in Edinburgh and Glasgow. He wrote numerous pieces for the pianoforte, of which he was called the poet, but he seldom composed for the orchestra. His music is largely based on various Slavonic rhythms. His mazurkas first introduced this style of music into France. His works include 19 nocturnes, 52 mazurkas, 27 études, 3 sonatas, 25 preludes, 13 waltzes, 12 polonaises, 5 rondos, 4 scherzos, 4 ballades, 4 fantaisies, a funeral march, several songs, &c. He united bold innovations with a classical style. See the Life by Karasowski (Eng. trans. 1879), and that by Villeby (1892).

CHOPINE, an elevated shoe or clog, introduced into England from Venice in the reign of Queen Elizabeth, and which became the fashionable wear of court ladies during that reign. The Venetian chopines were made of wood covered with leather of sundry colours, white, red, yellow, and sometimes gilt. Some were of great height, the height of the chopine being regarded as a mark of the rank of the wearer. To such a degree of extravagance was this carried that women of rank could not walk without being supported. This silly fashion does not seem to have been carried to the same excess in England. Hamlet (act ii. scene 2) addresses one of the players, 'Your ladyship is nearer to heaven than when I saw you last by the altitude of a chopine'. See Fairholt's Costume in England.

CHOP-STICKS (Chinese, *kwai-tsz'*, nimble or diligent lads), two smooth sticks, about the thickness of a quill, of bamboo, wood, or ivory, which are used by the Chinese for conveying meat or vegetables, particularly rice, to the mouth. The chop-sticks are used in various manners, serving partially the purposes of a fork and a spoon. The most curious mode of using the chop-sticks is when a bowl of rice is brought close to the lips, the mouth held wide open, and the grain dexterously dashed into it with the chop-sticks, held one on each side of the forefinger, and plied with a rapid motion quite suggestive of the Chinese title.

CHORAGUS, or **Choregus**, among the ancient Greeks, the musician who directed each of the choruses furnished by the ten Attic tribes for the public festivals; also the citizens who defrayed the expense of each chorus. The person of the choragus was inviolable, as well as those of the members of the chorus. The choragus who was adjudged to have performed his duty best received an ornamental tripod, engraved by a skilful artist, and bearing the name of the tribe which had gained the victory, of the citizen who had paid the expense, and of the master who had trained the choir. These tripods were set up as public monuments on pillars or other structures. A street in Athens which contained a great number of such monuments was called the Street of the Tripods. The most remarkable of these monuments yet remaining is the choragic monument of Lysicrates. See Chorus.

CHORALE, a musical term borrowed from the German. It signifies a simple melody set in parts to be sung in harmony by a number of voices to sacred words, usually in public worship: a psalm tune. In Germany the chorale is frequently sung in unison. This was the ancient practice, adopted before the laws of harmony were well understood.

CHORD (from the Greek *chordē*, a string of gut), in music, a combination of two or more sounds of different pitch, whether consonant or dissonant. A *common chord* is one composed of a fundamental tone and its third and fifth. See Music, sect. *Harmony*.

CHORLEY, a municipal borough and market town of England, in Lanchasire, on the Chor, 20 miles N.W. of Manchester. It consists of spacious well-built streets, and contains an ancient parish church, various other churches and chapels of modern date, together with a spacious town-hall, several large schools, club-houses, theatres, &c. The principal manufacture is that of cotton goods, but there are also bleaching, calico-printing, and dye-wood works, floor-cloth works, and iron-foundries. In the vicinity are coal, lead, and iron mines, and millstone quarries. Pop. in 1881, 19,742; in 1891, 23,087; in 1901, 26,850.

CHORUS, originally a special feature in the Greek drama. During the most flourishing period of Attic tragedy the chorus was a troop of male performers, wearing masks, and representing male or female characters, who, during the whole representation, were by-standers or spectators of the action. In the intervals of the action the chorus chanted songs, which related to the subject of the performance, and were intended either to augment the impression or to express the feeling of the audience on the course of the action. Sometimes it even took a direct part in the action by observations on the conduct of the dramatic characters, by advice, consolation, exhortation, or dissuasion. It usually represented a part, generally the oldest portion of the people, where the action happened, sometimes the counsellors of the king, &c. The chorus was an indispensable part of the representation. In the beginning it consisted of a great number of persons, sometimes as many as fifty; but the number of the tragic chorus was afterwards limited to fifteen; while the chorus in comedy numbered twenty-four. The exhibition of a chorus was in Athens an honourable civil charge, and was called *choragy*. (See Choragus.) The leader or chief of a chorus was called *coryphæus*, who spoke in the name of the rest when the chorus participated in the action. The chorus was often divided into two parts, who sung alternately. The divisions of the chorus were not stationary, but moved from one side of the stage to the other; from which circumstance the names of the portions of verse which they recited, *strophe*, *antistrophe*, and *epode*, are derived. But it cannot be determined in what manner the chorus sung. It is probable that it was in a sort of solemn recitative, and that their melodies, if we may call them so, consisted in unisons and octaves, and were very simple. They were accompanied by flutes. With the decline of ancient tragedy the chorus was omitted. Some modern tragedians, as Racine in France and Schiller in Germany, have attempted, with more or less success, to imitate or revive the Greek chorus. Shakespeare has employed devices founded on it.

Chorus, in modern music, is that part of a composite vocal performance which is executed by the whole body of the singers, in contradistinction to the solo airs and concerted pieces for selected voices. The singers themselves are also called the chorus.

CHOSE, in English law, a thing. *Chose local*, a thing annexed to a place; *chose transitory*, anything movable; *chose in action*, something in possession of another to which anyone has a claim; *chose in possession*, anything of which the possessor is the owner. In common law a chose in action cannot be made the subject of a transfer without the consent of the possessor or debtor. Negotiable instruments, such as bills of exchange, &c., are excepted from this rule, and the rule itself is disregarded in courts of equity, one of the inconsistencies of English law which calls for reform.

CHOSROES I., King of Persia, succeeded to the throne in 531. His memory is still venerated in the East, and his virtues obtained him the titles of the *Magnanimous* and the *Just*. At his accession to the crown Persia was involved in a war with Justinian, which Chosroes terminated successfully, obliging Justinian to purchase peace by the payment of a large sum of money. In 540, however, jealous of the victories of Belisarius, the great general of the empire, Chosroes violated the peace, invaded Syria, laid Antioch in ashes, and returned home laden with spoils. The war continued till 562, when the emperor again purchased peace by an annual tribute of 30,000 pieces of gold. The peace continued for ten years, when the war was renewed with Justin, the successor of Justinian, when Chosroes was again successful. Under the following emperor, Tiberius, the war continued, with doubtful result. Chosroes died in 579. His zeal for the administration of justice sometimes led him to acts of cruelty; but he encouraged the arts, founded academies, and made a considerable proficiency in philosophy himself. His reputation obtained him a visit from seven sages of Greece, who still adhered to the Pagan religion; and in a treaty with Justinian he required that they should be exempt from the penalties enacted against those who continued to favour Paganism. It was in the reign of Chosroes that the name of the Turks first became known to Europeans, first as friends, afterwards as enemies, of the Persian king.

CHOSROES II., grandson to the preceding, ascended the throne in 591, on the deposition of his father. He was assisted to secure the throne by the Emperor Mauricius, and on the assassination of the latter by Phocas (602) he took up arms against the empire, and refused to make peace at the solicitation of Heraclius, the succeeding emperor. By a long series of successes he raised the Persian power to the highest point, and reduced the empire to extremity. Heraclius, however, taking courage from despair, succeeded in a series of brilliant campaigns in recovering his lost provinces, 622–7. Chosroes, repeatedly defeated, was completely overthrown in the great battle of Nineveh. He fled with his favourite wife Sira, but after witnessing the massacre of his numerous sons he was thrown into a dungeon and assassinated by command of his son Siroes.

CHOTA NAGPORE, a division of British India, presidency of Bengal, divided into the districts of Lohardaga, Hazaribagh, Singbhum, Palamau, and Manbhum; area 26,966 square miles. It consists for the most part of an undulating plateau about 3000 feet above the sea, and rising occasionally into ridges of hills which stretch from E. to W. The drainage is received chiefly by numerous tributaries of the Subarna-rekha in the N.E., and by the north and south Coel and other streams in the S. and W. Much of the surface is overrun with jungle, or covered with forests containing teak and other kinds of valuable timber. The soil in the plains consists of a red loam, and where under cultivation produces excellent crops of wheat, barley, rice, pulse, cotton, and sugar-cane. Coal occurs in various localities, and is worked in the Karharbari coal-field in Hazaribagh. The trade, hampered by imperfect means of conveyance to leading marts, is limited, and is nearly confined to grain, lac, coarse silk, oil-seeds, and other agricultural products. Pop. (1891), 4,628,792.

CHOUANS, a name give to the royalist peasantry of Brittany and Lower Maine, who carried on a petty warfare against the republican government from an early period of the French revolution. The name Chouan was finally extended to all the Vendeans. The name was derived from the first chief of the Chouans, Jean Cottereau, who with his three brothers organized these bands in 1792, under the inspiration of the Marquis de la Rouarie, an ardent leader of the royalists. Cottereau was the son and grandson of persons engaged in the manufacture of wooden shoes. He had joined a band of dealers in contraband salt, and acquired the surname Chouan from the cry of the screech-owl (*chat-huant*), which he used as a signal with his companions. He was killed in an engagement with the republican troops, 28th July, 1794. The Chouans are accused of having made the royalist cause a pretext for highway-robbery, pillage of towns and villages, and other irregularities. In 1793 the Chouans joined the royalist army of La Vendée, under the title of La Petite Vendée, but they refused to obey any leader but Jean Chouan (Cottereau), who was consequently continued in their command. After the sanguinary defeat of the royalists at Savenay, Dec. 27, 1794, the Chouans returned to their haunts, and resumed their guerilla warfare, which was conducted with every excess calculated to inspire terror. The most popular of their leaders was Georges Cadoudal, who maintained a certain discipline and organization, and waged an implacable war against the republican authorities and troops. Forced to submission by Hoche in 1796, and Brune in 1800, he passed over to England, and returning to France in 1803, attempted again to raise the flame of civil war in Brittany, but failing in his enterprise he went to Paris and entered into a conspiracy against Napoleon, for which he was executed. In the meantime, through repeated disasters, and some experience of the vanity of trusting in princes, the spirit of insurrection had been gradually declining in the west; but although 1800 is usually assigned as the date when the open enterprises of the insurgents came to a close, it cannot be said to have been extinguished until the arrest and death of its most active promoter in 1804. An attempt indeed was made to revive the Chouan insurrection during the hundred days in 1815. Some old insurgents still remained, who organized a new resistance to the imperial authority, but they were suppressed after some engagements by General la Marque.

CHOUGH, Cornish Chough, or Red-legged Crow, the trivial name of a species of crow (*Frugilegus graculus*). It is about the size of a pigeon, and has a sharp cry, is nearly omnivorous, is distinguished by its red bill and legs, and is of a dark ash colour about the neck and under the belly, though frequently entirely black. The choughs live together in large flocks, and make their nests in steeples, old towers, or more generally cliffs. Their manners are very similar to those of the rooks, with which they are sometimes seen flying in company. They are exceedingly vigilant in guarding their nests and young from birds of prey, which they attack and drive off with great vigour. (Pl. III. at Ornithology.)

CHOUMLA. See Shumla.

CHRISM, (from the Greek *chrisma*, salve), the holy oil prepared on Holy Thursday by the Catholic bishops, and used in baptism, confirmation, ordination of priests, and the extreme unction. The name is derived from the Greek word 'to anoint.'

CHRIST (Greek *Christos*, the anointed; *Messiah*, from the Hebrew, has the same signification). See Christianity and Jesus.

CHRIST, Pictures of. The representations of the person of the Saviour which for a succession of ages have constituted one of the most important subjects of Christian art, and have occupied the highest genius, especially of Catholic artists, are all evidently ideal. The attempt to represent the personal appearance of the Saviour can hardly be traced back further than the age of Constantine. The origin of Christian art, indeed, has been traced successfully to the catacombs of Rome, and is not to be considered as springing directly from Pagan art, although the great Italian masters of the middle ages may have derived much instruction from classical models; but the painting and sculpture of the early Christians were chiefly allegorical, representing the moral of the gospel parables, or similar symbolic representations of Christian doctrine, without regard to historical accuracy of portraiture. At a later period legends were invented of various likenesses of the Saviour having been preserved by miraculous or other remarkable means, but these stories are intrinsically weak and improbable, and are entirely destitute of external evidence. They are of such a nature as that King Abgarus of Edessa had a napkin sent him by the Saviour himself, in which he had caused his likeness to be miraculously impressed by placing his face in it. A portrait is said to have been similarly impressed on a handkerchief of Saint Veronica, and Saint Luke is said to have taken one himself. An apocryphal letter of Lentulus, the predecessor of Pilate, addressed to the Roman senate, contains a description of the person of Jesus. One of the earliest professed portraits of the Saviour is in the Calixtine Catacomb near Rome. He is represented with the hair parted on the forehead, and falling over the shoulders in long waving locks. In regard to this common notion it may be observed that when St. Paul wrote his first epistle to the Corinthians there were probably many Christians scattered over the world who remembered the personal appearance of the Saviour, and if this representation of it had been correct he would hardly have written to a Christian church that it was contrary to nature and a shame for a man to have long hair. The great painters of the middle ages, to whom we owe the ideal representation of Christ which has now become common in symbolical paintings, probably founded somewhat upon these early notions. A Christ of the fourth century with an oval face, oriental features, parted hair, and a short straight beard, is said to have been the model of the Byzantine and Italian painters till the time of Michael Angelo and Raphael.

CHRISTCHURCH, a municipal and parliamentary borough of England, in the south-west of Hampshire, the municipal borough, or Christchurch proper, being pleasantly situated at the confluence of the Avon and Stour, about 1 mile from the sea. There is a fine old priory church built in the cathedral style, with a magnificent stone altar-screen. It is mainly in the Norman and Perpendicular styles. Fusee chains for watches used to be manufactured in Christchurch. The parliamentary borough comprises the rapidly increasing and favourite watering-place Bournemouth, and sends one member to parliament. Pop. parl. bor. in 1881, 28,535: in 1901, 67,924; of mun. bor. in 1901, 4204.

CHRISTCHURCH, a town of New Zealand, capital of the province of Canterbury, and the see of the primate of New Zealand, is situated on the Avon River 7 miles from the sea. A railway tunnelled through the Lyttelton Hills connects it with Lyttelton, the nearest port. It contains a number of handsome buildings, including a fine cathedral, the government offices, St. Michael's Church, the supreme court, hospital, museum, town library, lunatic asylum, convent, theatre, banks, club-house, and college. It is the terminus of the Great Northern and Southern Railway, and has a flourishing trade and manufactures. Pop. in 1891, 16,520, or including extensive suburbs, 46,000; in 1901, 57,041.

CHRIST CHURCH, a college of Oxford University, projected by Cardinal Wolsey, and established in 1546 by Henry VIII. It consisted of a dean, eight canons (since reduced to six), a hundred students, eight chaplains (since reduced to six), a schoolmaster, an organist, eight clerks, and eight choristers. According to the present statutes, which came into force in 1882, the students, who are equivalent to fellows, are divided into two classes, and are in number about thirty, besides honorary students. There is also a body of scholars, over forty in number, some of whom are elected annually from Westminster School, while others are chosen by open competition for proficiency in mathematics, physical science, or history. The students are appointed in the first instance for two years, but this term may be prolonged. There are also many exhibitioners.

CHRISTIAN II., King of Denmark, Norway, and Sweden, the son of Hans, and grandson of Christian I., kings of Denmark, &c., was born 2nd July, 1480. In 1501 he was named successor to the crown, and took part in the government of Norway, which he conducted with great severity, suppressed two insurrections in 1502 and 1508, and made an unsuccessful incursion into the Isle of Gottland, with a view to restrain the communications of the Swedish insurgents with the Hanseatic towns. On his accession to the throne in 1513 he signed a *capitulation* in favour of the privileges of the lay and clerical aristocracy in his dominions, including the independent administration of justice; but all his efforts were bent towards strengthening the royal power, particularly in Sweden, which refused to acknowledge him. To strengthen himself against Steen Sture, the administrator of Sweden, who had set himself in opposition to the Union of Calmar formed in 1397 between Norway, Sweden, and Denmark, he asked and obtained the hand of Isabel, daughter of Philip I. of Castile, and sister of Charles V. of Germany, whom he married in 1515. He had already a mistress called Dyveke, the daughter of a Dutch woman who kept an inn at Bergen in Norway. She exercised a great influence over the king, and by her liberal spirit and knowledge of the institutions of Holland tended greatly to improve the administration of his government. She became a sort of prime minister, and had great influence in originating those wise laws which gained for this king the love of his subjects. But she incurred the hatred of the nobility, and in 1517 she died of poison. Suspicion fell on the relatives of Torbern Oxe, a young nobleman who had conceived a passion for her. The resentment of the king was aroused against Oxe himself, who, in defiance of the capitulation, was tried by a jury of peasants, condemned, and executed. Soon after war broke out with Sweden, and in 1518 Christian made an unsuccessful expedition to Stockholm. The chief of the Danish partisans, Gustavus Trolle, archbishop of Upsala, was deprived and imprisoned by the Swedish nobles. Pope Leo X. hereupon excommunicated Sture, put the kingdom under an interdict, and charged Christian with the execution of his bull. Making all the preparations and alliances in his power, Christian sent an army into Sweden commanded by Otto Krumpen, who defeated the Swedes in the decisive battle of Bogesund (Ulrikehamn), 19th January, 1520, in which Steen Sture the administrator was killed. Stockholm, under the command of the widow of Sture, stood a siege of four months, during which period the rest of the country was subdued, and on the 4th of November Christian was crowned King of Sweden. Yielding to his clerical advisers the king now committed various severities, both in Sweden and Denmark, persecutions for heresy and political trials and executions took place in both countries. Two bishops were among the victims in Sweden, and the widow of Sture was imprisoned in Denmark. At the same time Christian set himself diligently to continue his work of legislative reform. Unity of weights and measures and a new and regular tariff were established, a post-office, sanitary police, and means of primary instruction for the people were organized, and the superior schools reformed. The peasantry, who had been subjected to feudal servitude by the numerous German nobles resident in Denmark, were emancipated. He also encouraged commerce, proposed making Copenhagen a free port as a rival of Lübeck, established municipal government in the towns of Denmark, and erected an ecclesiastical tribunal independent of Rome. In the meantime Sweden had revolted under Gustavus Vasa, who had expelled the Danish garrisons and been proclaimed administrator. Christian was engaged in a feudal contest with his uncle Frederick, and Lübeck, in alliance with Vasa, declared war and threatened Copenhagen. To find the means of defence Christian convoked the diet towards the close of 1522. Instead of attending it the nobles and prelates assembled at Wiborg in Jutland, proclaimed the deposition of Christian, and called his uncle Frederick to the throne. Christian fled to the Netherlands to claim the succour of his brother-in-law Charles V. Gustavus, already master of Sweden, put an end to the union of Calmar in 1523, and was proclaimed king. Christian remained nine years in exile without obtaining aid from Charles, who allowed the queen his sister to die in indigence. He visited England and Germany, and adopted the reformed faith. At length, with the assistance of Charles, he equipped a fleet in Holland, landed in Norway in 1531, and was proclaimed king by the Norwegian diet, which had refused to recognize Frederick. The commander of the Danish fleet, a bishop, having offered him a safe conduct, he repaired to Copenhagen to negotiate with Frederick, who disavowed the admiral, and retained him prisoner. He was confined for twelve years in the Castle of Sonderburg, island of Alsen, in a dungeon of which the door was walled up, the only access being by the window, and his only attendant a Norwegian dwarf. In 1544 Christian III. somewhat relaxed the rigour of his confinement, and in 1549, on renouncing his right to the crown, he was permitted to reside in the Castle of Kallundborg in Zealand, where he was subjected to a less severe surveillance, until his death in 1559. His misfortunes were chiefly due to the enmity excited among the aristocracy, lay and clerical, of Denmark, by his reforms, and to his violation of the capitulation entered into at his coronation. So great was this enmity that his successor Frederick was obliged to promise never to set him at liberty.

CHRISTIAN IV., King of Denmark, son of Frederick II. and the Princess Sophia of Mecklenburg, born in Zealand in 1577, succeeded to the throne as a minor in 1588, and early gave numerous proofs of a sincere love of religion and justice, and a high esteem for science and art. Having married Anna Catherina, princess of Brandenburg, he made his celebrated voyage to the North Cape to learn the boundaries of his kingdom and protect the rights of his subjects in that remote region from any foreign interference with their coasting trade. He was afterwards, in consequence of the claims advanced by Sweden to Lapland, engaged in what is called the Calmar War with Charles IX. and his successor Adolphus, and terminated it by an advantageous peace, in which he stipulated for the free navigation of the Baltic. In 1613 he attempted in vain to diminish the prerogatives of the nobles, and ameliorate the servitude of the peasantry. In the Thirty Years' war he was beaten by Tilly at Lutteram-Barenberge in 1626, but afterwards, in conjunction with Gustavus Adolphus, obtained the Treaty of Lübeck, 1629. He has the merit of having laid the foundation of the Danish navy, extended the trade of his subjects to the East Indies, introduced a judicious system of finance, and fitted out several expeditions for the discovery of a north-west passage. He died in 1648, and was succeeded by his son Frederick III.

CHRISTIAN VII., King of Denmark, son of Frederick V. and Louisa of England, born in 1749, ascended the throne in 1766, and same year married Caroline Matilda, sister of the British monarch George III. He afterwards travelled for three years in England, Germany, Holland, and France, became a member of several learned academies, and returned to Denmark with the title of Doctor of Laws conferred upon him by the University of Cambridge. Youthful indulgences, however, had weakened his intellect, and obliged him to confide the charge of public business to his ministers, and more especially it is said to his favourite physician Struensee, who, though he had gained the affections of Christian and his young bride, was very unpopular as a statesman, and made innovations which provoked the hostility both of the nobility and the army. The queen-dowager, who had previously failed in an attempt to produce a rupture between the king and queen, with the view of placing herself at the head of affairs, now joined the disaffected party, and along with her son, the hereditary prince, Frederick, the king's half-brother, compelled the imbecile Christian to issue an order of arrest against Struensee in 1772. This was followed by the arrest of the queen on the charge, now generally believed to be groundless, of having had a criminal intrigue with him. The queen-dowager and her son now obtained the sole management of public affairs. The king, who had long reigned only in name, died in 1808 at Rendsburg in Holstein, to which he had been removed on the bombardment of Copenhagen by the British. Notwithstanding the unfortunate circumstances of Christian's reign, several important improvements took place under it. Serfdom was abolished in the duchies, trade and commerce promoted, the Schleswig-Holstein Canal constructed, and excellent roads formed throughout the kingdom. Christian left two children, a son who succeeded him as Frederick VI., and a daughter married in 1814 to the Duke of Holstein Augustenburg.

CHRISTIANIA, a city and port, the capital of Norway, province Aggershuus or Christiania, at the head of the long narrow inlet called Christiania Fjord, about 60 miles from the open sea or Skagerrack. High hills rise around it on all sides, excepting towards the bay, but at considerable distances, particularly on the north. The houses are mostly of brick and stone, few of the ancient picturesque log-houses now remaining; they are generally plain buildings, devoid of architectural pretension. The most interesting building perhaps in the town is the fine old castle of Akershus (built about 1300), with its church and planted ramparts, crowning a point jutting out into the fjord, and commanding a fine view, but of no military value. At the west end of the town there are some handsome mansions. Here also stands, on a gentle elevation, and in the midst of a beautiful park, the royal palace—a massive square building, without any architectural ornament, but commanding delightful views of the fjord and its beautifully winding shores. The hall in which the

Storthing holds its sittings is a very plain building. The other public edifices are the military academy, cathedral, university, &c. None of the churches possess any particular architectural interest. Attached to the university is a museum, containing a fine collection of antiquities. The climate of Christiania is delightful. It is screened from violent winds; and even in winter, though the cold is severe, the weather is seldom variable, but bright and settled, and free from damp and fog. In summer it is warm but not sultry, with a light and buoyant atmosphere. The few manufactures of the city consist of woollen cloth, iron-ware, tobacco, paper, leather, soap, spirits, glass, &c. There are also some extensive breweries. The exports are principally timber, deal planks, and iron. The environs of the city are exceedingly beautiful, the approach to it by the magnificent fjord, at the head of which it is situated, exciting the admiration of all visitors. The fjord is frozen for upwards of two months in the year, for about 20 miles from Christiania to the sea; and the harbour is generally locked up for three or four months. Pop. (1897), 203,337.

CHRISTIANITY, the religion instituted by Jesus Christ. Christianity, as it now exists in our minds, has received, from the influence of the priesthood, of national character, of the spirit of the time, and the thousand ways in which it has been brought into contact with politics and science, a variety of impure additions, which we should first separate in order to understand what it is in reality. There could be no better means of attaining a correct understanding of it than to investigate, historically, the religious principles which Jesus himself professed, exhibited in his life, and laboured to introduce into the world, if the investigator could avoid giving the colouring of his own views to his explanation of the records of the origin of Christianity. But the most honest inquirers have not entirely succeeded in so doing. Even the Christian theologians of the present age, though divided less by the spirit of creeds and parties than of scientific methods and philosophical speculations, dispute respecting the principle that constitutes the basis of the religion of Christ (see the articles Religion, Revelation, Rationalism, and Supernaturalism). This principle appears, by its effect upon the numerous nations, differing so greatly in intellectual character and cultivation, which received Christianity at first, to have been a universal truth adapted to the whole human race, and of a divine all-uniting power. The Jews believed in a living God, the Creator of all things, and, so far, had just views of the source of religion. The Greeks, besides developing the principle of the beautiful in their works of art, had laid the foundations of valuable sciences applicable to the business of life. The Romans had established the principles of law and political administration, and proved their value by experience. These scattered elements of moral and intellectual cultivation, insufficient in their disunited state to bring about the true happiness and moral perfection of man in his social and individual capacity, were refined, perfected, and combined by Christianity, through the law of a pure benevolence, the highest aim of which is that of rendering men good and happy, like God, and which finds in the idea of a kingdom of heaven upon earth, announced and realized by Christ, all the means of executing its design. His religion supplied what was wanting to these nations—a religious character to the science of Greece, moral elevation to the legislative spirit of Rome, liberty and light to the devotion of the Jews—and, by inculcating the precept of universal love of mankind, raised the narrow spirit of patriotism to the extended feeling of general philanthropy. Thus the endeavours of ancient times after moral perfection were directed and concentrated by Christianity, which supplied at the same time a motive for diffusing more widely that light and those advantages which mystery and the spirit of castes had formerly withheld from the multitude. It conveyed the highest ideas, the most important truths and principles, the purest laws of moral life to all ranks; it proved the possibility of perfect virtue through the example of its Founder; it laid the foundation for the peace of the world through the doctrine of the reconciliation of men with God and with each other; and, directing their minds and hearts towards Jesus, the Author and Finisher of their faith, the crucified, arisen, and glorified Mediator between heaven and earth, it taught them to discern the benevolent connection of the future life with the present. The history of Jesus, and the preparations of God for his mission, afforded the materials from which Christians formed their conceptions of the character and tendency of their religion.

The first community of the followers of Jesus was formed at Jerusalem soon after the death of their Master. Another at Antioch in Syria first assumed (about 65) the name of *Christians*, which had originally been given to them by their adversaries as a term of reproach; and the travels of the apostles spread Christianity through the provinces of the Roman Empire. Palestine, Syria, Asia Minor, Greece, the islands of the Mediterranean, Italy, and the northern coast of Africa, as early as the first century, contained societies of Christians. Their ecclesiastical discipline was simple and conformable to their humble condition, and they continued to acquire strength amidst all kinds of oppression (see Persecutions of Early Christians). At the end of the second century Christians were to be found in all the provinces, and at the end of the third century almost one-half of the inhabitants of the Roman Empire, and of several neighbouring countries, professed this belief. The endeavour to preserve a unity of faith and of church discipline in the midst of the varying opinions and practices that prevailed (see Heretic), often led to ecclesiastical tyranny, notwithstanding the oppressions which the first Christians themselves had experienced from the Jewish priesthood. At the beginning of the fourth century, when the Christians obtained, by means of Constantine the Great, first toleration, and soon afterwards superiority in the Roman Empire, the bishops exercised the power of arbiters of faith in the first general council (see Nice), 325, by instituting a creed binding on all Christians. Upon this foundation the later councils (see Council), assisted by those writers who are honoured by the church as its fathers and teachers, erected the edifice of the orthodox system, while the clergy, being elevated above the laity as a privileged sacred order, were enabled—partly by their increasing authority in matters of church discipline, partly by the belief that certain traditions from the apostles were inherited by them only—to make themselves gradually supreme masters of the church (see Bishop, Popes, Hierarchy). This result was also promoted by the favour of the emperors, such as Theodosius,—with slight interruptions in the reign of Julian and some of his successors—by the increased splendour and various ceremonials of divine worship (see Mass, Saints, Relics, Iconoclasts), by the decline of classical learning, the increasing superstition resulting from this increase of ignorance, and by the establishment of the monastic system (see Monastery). In this developed form Christianity, which had been introduced among the Goths in the fourth century, was spread among the other Teutonic nations in the west and north of Europe, and subjected to its power during the seventh and eighth centuries the rude warriors who founded new kingdoms on the ruins of the Western Empire. Meanwhile, however, it was losing ground in Asia and Africa before the encroachments of the Saracens, by whose rigorous measures hundreds of thousands of Christians were forced into Mohammedanism, the heretical sects which had been disowned by the orthodox church being almost the only Christians who maintained themselves in the East (see JACOBITES, COPTS, ARMENIAN CHURCH, MARONITES, NESTORIANS).

During this progress of Mohammedanism, which, in Europe, originally extended only to Spain and Sicily, the Roman popes (see POPES and GREGORY VII.), who were advancing systematically to full ecclesiastical superiority in the west of Europe, gained more in the north, and soon after, in the east of this quarter of the world, by the conversion of the Slavonic and Scandinavian nations (from the tenth to the twelfth century), than they had lost in other regions. For the Mohammedans had chiefly overrun the territory of the Eastern Church (see GREEK CHURCH), which had been since the fifth century no longer one with the Western (Latin) Church, and had by degrees become entirely separate from it. In the tenth century it received some new adherents by the conversion of the Russians, who are now its most powerful support. But the Crusaders, who were led partly by religious enthusiasm, partly by the desire of conquest and adventures, to attempt the recovery of the holy sepulchre, gained the new kingdom of Jerusalem, not for the Greek emperor, but for themselves and the Papal hierarchy (see CRUSADES). The confusion which this finally unsuccessful attempt against the infidels introduced into the civil and domestic affairs of the western nations gave the church a favourable opportunity of increasing its possessions and asserting its claims to universal monarchy. But, contrary to the wishes and expectations of the rulers of the church, the remains of ancient heresies (see MANICHÆANS, PAULICIANS) were introduced into the West through the increased intercourse of nations and by the returning Crusaders, and new ideas of another sort were also propagated, springing from the philosophical spirit of examination of some of the schoolmen (see ABELARD, ARNOLD OF BRESCIA). An opposition of various societies and sects against the Roman hierarchy thus arose, and very severe measures were often adopted against them (see CATHARI, ALBIGENSES, WALDENSES). The foundation and multiplication of ecclesiastical orders (see ORDERS—RELIGIOUS), particularly the Franciscans and Dominicans, for the care of souls and the instruction of the people, however much it tended to promote the interests of the clergy and the papacy, did little to confute heresy; and bold speculations which would not yield to persuasion were still less likely to be extirpated by the power of the Inquisition, which armed itself with fire and sword. The insufficiency of what the church taught to meet all the religious wants of the human mind and heart was felt and seen by many, partly from their knowledge of the spirit of Jesus derived from the Bible, which was often studied in secret by curious readers in spite of clerical prohibitions, and partly from the bold eloquence of single teachers and chiefs of sects. Ecclesiastical orders also desired to pursue their own course, apart from what might be the highest interest of the church as a whole (see KNIGHTS TEMPLARS, FRANCISCANS); offended princes forgot the great services of the Papal power in promoting Christianity and civilization in the first centuries of the middle ages; and some of the popes themselves made little effort to reform prevailing evils. They even afforded the unedifying spectacle of a great schism in the church from 1378 to 1429, and 1439–49 (see POPES), which was thus distracted for more than half a century by the quarrels between two candidates who both asserted their right to the Papal chair. This schism seems to have been what chiefly led Wickliffe to examine the claim of the bishops of Rome to the supremacy of the church, a claim which he was led to reject. The doctrines of Wickliffe (see WICKLIFFE) thus gave rise to a party opposed to the popedom; and the revolt of the adherents of the Bohemian Huss (see HUSS, HUSSITES), who was burned at Constance on account of doctrines derived from Wickliffe, extorted from the Council of Basel (1432–43) certain compacts, which, being firmly maintained, proved what a strong opposition to the abuses of the church might be able to effect. In regard to the movement that took place in the next century, and in which Luther was the great actor we refer the reader to the article REFORMATION, and the articles relating to it. The Reformation is naturally regarded with widely different sentiments by Protestants and Roman Catholics. But that this great change in the church has restored Christianity to its original simplicity and purity the most zealous Protestants will not assert, any more than the reflecting Catholic will deny the necessity that then existed for some reform—a necessity which indeed resulted in the holding of the Council of Trent. On this subject a Roman Catholic writer remarks that 'The true and Catholic Reformation, long desired, but delayed by many difficulties, was taken up and successfully accomplished by the Council of Trent (1545–1563)'. See TRENT (COUNCIL OF), ROMAN CATHOLIC CHURCH, and PROTESTANTISM.

The forms under which Christianity appears in our days are very various. By opening the Bible to all, Protestantism aroused the spirit of inquiry, but also gave rise to an immense variety of sects, springing from the different views which different men were led to form from the study of the sacred volume. The present moral and political condition of Christian Europe, though affected by so many influences foreign to religion, yet distinctly bears the stamp of Christianity, and this has been impressed upon its colonies and other distant lands. But if we look among our contemporaries we shall find pure Christianity in no nation and in no religious party, though we may perceive its features in the conduct of the enlightened and pious among all nations who love Christ, and are penetrated with his Spirit. Notwithstanding their divisions the great body of Protestant sects have so much in common that they may still be considered as forming one great family among the principal divisions of the Christian world. The differences which divide the scientific and philosophical world in respect to Christianity, open up a wider field of speculation and also of controversy, on which it would be unprofitable here to enter.

CHRISTIANS, the general name of the followers of Christ. See CHRISTIANITY.

CHRISTIANS, the name of a denomination in the United States and Canada, adopted to express their renunciation of all sectarianism. They have become well known in all parts of the country, the number of their churches being estimated at over 1000, with more than 250,000 communicants. Each church is an independent body: they recognize no creed, no authority in matters of doctrine: the Scriptures, which every individual must interpret for himself, are their only rule of faith: admission to the church is obtained by a simple profession of belief in Christianity: speculative belief they treat as of little importance, compared with virtue of character. In

New England they separated principally from the Calvinistic Baptists: in the Southern States from the Methodists; and in the Western from the Presbyterians. There was therefore at first a great diversity of opinion and practice among them, each church retaining some of the peculiarities of the sects from which it seceded. To maintain a connection between the different churches, one or more conferences are formed in each state, consisting of members delegated from each church There are now more than seventy of these conferences, which again form, by delegation, the United States General Christian Conference. They have several periodical works, and several institutions of learning, Antioch College being the most celebrated. They consider Christ as the Son of God, miraculously conceived, whose death was a ratification of the new covenant, not a propitiatory sacrifice; and the Holy Ghost or Spirit as the power or energy of God, exerted in converting the wicked and strengthening the good. They hold to the inspiration and divine authority of the Bible, which they allow everyone to interpret for himself.

CHRISTIANSAND, a seaport of southern Norway, on a small fjord branching off the Skager Rack, about 160 miles s.w. of Christiania. It is picturesquely situated; the streets are broad and straight, and the houses, which are mostly built of wood, have in many cases extensive gardens. Christiansand is the see of a bishop, and has a cathedral, a whitewashed building of gray stone. It is fortified, and possesses a citadel. Its harbour is one of the best in Norway, but is frozen for about four months in the year. It has a considerable export trade in timber and fish, and carries on the repair of vessels which put in to refit. The town was founded in 1641 by Christian IV. Pop. (1900), 14,666.

CHRISTIANS-OE, a group of islands in the Baltic, 13 miles N.E. of Bornholm, belonging to Denmark, named from the chief island, which has a port, a lighthouse, and a castle. Pop. 2000.

CHRISTIANS OF ST. JOHN, a sect of religionists found in Asiatic Turkey, chiefly in the neighbourhood of Bassorah. They profess to follow the teaching of John the Baptist, and are wrongly called Christians since they reject Christ. They are practically heathens, whose deities are darkness and light. Other names for them are Mendeans, Mendaites, Mandaites, and Sabians.

CHRISTIANS OF ST. THOMAS, the name of a sect of Christians on the coast of Malabar, in Southern India, to which region the apostle St. Thomas is said (by a tradition that has little to justify it) to have carried the gospel. The facts of their history are not well made out. They originally belonged probably to a body of Christians who, in the year 499, united to form a Syrian and Chaldaic church in Eastern Asia, and who were adherents of the doctrines taught by the heretic Nestorius. (See NESTORIUS.) At an early date (seventh century) the Persian church had adopted the name of Christians of St. Thomas, and the Christians of Malabar received bishops from Persia. Latterly the Christians of St. Thomas gained the position of a military caste which locally had considerable power. When the Portuguese gained a position in Malabar these Christians were forced to join the Roman Church (1599). But in 1653 many of them renounced this union, and having in 1665 received a bishop sent by the patriarch of Antioch, they have since belonged to the Jacobite body of Eastern Christians. (See JACOBITES.) The church is now under seven bishops with a patriarch at the head; and the adherents number about 300,000. They give communion in both kinds mixed together, pray for the dead, practise confession, &c., but they reject the doctrine of purgatory, the use of images, and prayer to the Virgin and the saints. They allow the consecration of a married layman or deacon to the office of priest. Their churches contain no symbols nor pictures except the cross. Their liturgy is similar to the Syrian, and the Syrian language is used in it. At present they are, under the British government, free from any ecclesiastical restraint, and form among themselves a kind of spiritual republic, in which the priests and elders administer justice, using excommunication as a means of punishment. See The Indian Empire, by Sir W. W. Hunter.

CHRISTIANSTAD, a fortified town of southern Sweden, in the län or county of same name, on a peninsula in the Helge Lake, not far from the mouth of the Helge River; about 10 miles from the shores of the Baltic, and 260 s.w. of Stockholm. It is well built, and is prettily situated, and has a citadel. There are manufactures, to a small extent, of gloves, linen and woollen fabrics. It has also some trade through the port of Åhus, at the mouth of the Helge, the harbour of which belongs to Christianstad. Granite and wood pulp are exported, and grain, coals, &c., imported. Pop. (1900), 10,318.

CHRISTIANSTEDT, a seaport in the U. States island of St. Croix, in the West Indies, on the north shore of the island. The harbour is difficult of access, being encumbered with many shoals, one of which stretches out nearly 2 miles to seaward in a N.E. direction. This town was the capital of the former Danish West Indies. Pop. 9600.

CHRISTIANSUND, a seaport town on the N.W. coast of Norway, capital of the bailiwick of Romsdal, 82 miles s.w. of Trondhjem, on three islands or rather rocks, which inclose its beautiful land-locked harbour. The surface of the islands on which the town is situated is so irregular that hardly any two houses, which are all of wood, coloured with red ochre, stand exactly on the same level. The trade of the place is considerable, and the town itself is fast rising into importance. The principal export is dried cod, chiefly for the Spanish and Italian markets. From its singular position there are scarcely any regular streets in Christiansund, and the communication between one part of the town and another is kept up chiefly by water. The town was founded in 1734 by Christian VI. of Denmark. Pop. (1900), 12,050.

CHRISTINA, Queen of Sweden, born Dec. 9, 1626, was daughter of Gustavus Adolphus and the Princess Maria Eleonore of Brandenburg. Gustavus, who beheld in Christina the only support of his throne, took the greatest care of her education, which was conducted in a masculine manner. She was instructed in all the sciences adapted to improve her mind and strengthen her character. After the death of Gustavus, at Lützen, in 1632, the states-general appointed guardians to the Queen Christina, then but six years old. These were the five highest officers of the crown, who were intrusted at the same time with the administration of the kingdom. The education of Christina was continued according to the plan of Gustavus Adolphus. She learned the ancient languages, history, geography, politics, and renounced the pleasures of her age in order to devote herself entirely to study. In 1642 the states-general proposed to her to take the administration into her own hands; but she excused herself on the ground of her youth. Only two years after she took upon herself the government. A great talent for business, and great firmness of purpose, distinguished her first steps. She terminated the war with Denmark, begun in 1644, and obtained several provinces by the treaty concluded at Brömsebro in 1645. She then, contrary to the advice of Oxenstiern, who hoped to gain, by the continuance of the war, still greater advantages for Sweden, laboured to re-establish peace in Germany, in order to be able to devote herself uninterruptedly to the sciences and the arts of peace. France, Spain, Holland, and England sought her friendship. She promoted commerce by wise legislation, and patronized the learned and literary institutions. The nation was devoted to her, and rejoiced to see the daughter of Gustavus at the head of the government, surrounded by generals and statesmen formed by that great prince. It was the universal wish that the queen should choose a husband; but her love of independence rendered her averse to such a connection. Among the princes who sued for her hand, her cousin, Charles Gustavus of Deux-ponts, was distinguished for his intelligence, noble character, and extensive knowledge. She declined his offer, but induced the states-general in 1649 to designate him for her successor. In 1650 she caused herself to be crowned with great pomp, and with the title of *king*. From that time a striking change in her conduct was perceptible. She neglected her ancient ministers, and listened to the advice of ambitious favourites. Intrigues and base passions succeeded to her former noble and useful views. The public treasure was squandered with extravagant profusion. Distinctions were conferred upon the undeserving, and jealousy produced murmurs, complaints, and factions. In this state of confusion the queen declared her intention of abdicating the crown. The old ministers, honouring the memory of Gustavus Adolphus, remonstrated in the strongest terms, and above all, Oxenstiern expressed himself with so much energy that the queen desisted from her resolution. She now grasped with more firmness the reins of government, and dissipated for a time the clouds which had darkened her throne. She occupied herself again with study, bought paintings, medals, manuscripts, books, maintained a correspondence with many learned men, and invited several to her court. Descartes, Grotius, Salmasius, Bochart, Huet, Chevreau, Naudé, Vossius, Conring, Meibom, appeared in Stockholm, and the queen conversed familiarly with them on literary and philosophical subjects. But new troubles occurred; and the conspiracy of Messenius threatened not only the favourites of the queen, but the queen herself. Christina, who loved whatever was uncommon, resumed her determination to resign the crown.

In 1654, at the age of twenty-nine, she assembled the states-general at Upsal, and in their presence laid aside the insignia of royalty to surrender them into the hands of Prince Charles Gustavus. She reserved to herself a certain income, entire independence, and full power over her suite and household. A few days after she left Sweden, and went through Denmark and Germany to Brussels, where she made a public entry, and remained for some time. There she made a secret profession of the Catholic religion, which she afterwards publicly confirmed in Innsbruck—a step which excited great astonishment, and of the causes of which nothing certain is known. Christina went from Innsbruck to Rome, which she entered on horseback in the costume of an Amazon, with great pomp. When the Pope Alexander VII. confirmed her she adopted the surname of *Alessandra*. In 1656 she visited France, and remained at Fontainebleau, at Compiègne, where the court was then held, and at Paris. Her dress and manners produced an unfavourable impression, but her talents and knowledge were generally admired. She offered to mediate between France and Spain; but Mazarin declined the offer, and succeeded in accelerating her departure from France under various pretexts. In the following year she returned. This second residence in France was rendered remarkable by the execution of her grand equerry Monaldeschi, who had enjoyed her entire confidence, but whom she accused of treason. This act of vengeance, though defended by Leibnitz, is a stain on the memory of Christina. The French court testified its displeasure, and two months passed before the queen showed herself publicly in Paris. In 1658 she returned to Rome, where she received very unpleasing news from Sweden. Her revenue was not transmitted to her, and nobody would make her advances. Alexander VII. relieved her from this embarrassment by a pension of 12,000 scudi (crowns). After the death of Charles Gustavus in 1660, the queen made a visit to Sweden, under pretence of wishing to arrange her private affairs; but it was soon perceived that she had other views. As the crown-prince was very young, she declared that in case of his death she should lay claim to the throne. This project was unfavourably received, and she was compelled to sign a formal act of abdication. Other unpleasant circumstances induced her to abandon Stockholm. She visited Sweden a second time in 1666, but returned to Hamburg without reaching the capital, having heard that the public exercise of her religion would not be allowed her. About this time she aspired to the Polish crown, but the Poles took no notice of her wishes. Finally she returned to Rome, where she passed the remainder of her life in the cultivation of the arts and sciences, giving way at times to fits of sensual indulgence. She founded an academy, collected valuable manuscripts, medals, and paintings, and died, after having experienced many vexations, April 19, 1689. She was interred in the Church of St. Peter, and the pope erected a monument to her with a long inscription. She had asked only for these few words: *Vixit Christina annos LXIII.*

CHRISTMAS, the feast of Christ's birth, was, according to many critics, not celebrated in the first centuries of the Christian church, as the Christian usage in general was to celebrate the death of remarkable persons rather than their birth. The death of the martyr Stephen, and the massacre of the innocents at Bethlehem, had been already long celebrated, when, perhaps in opposition to the doctrine of the Manichæans respecting the birth of the Saviour, a feast was established in memory of this event in the fourth century. In the fifth century the Western Church ordered it to be celebrated for ever on the day of the old Roman feast of the birth of Sol, on the 25th of December, though no certain knowledge of the day of Christ's birth existed. Among the German and Celtic tribes the winter solstice was considered an important point of the year, and they held their chief festival of yule to commemorate the return of the burning-wheel. The holly, the misletoe, the yule log, and the wassail bowl relate more to paganism than to Christianity. In the East Christmas was celebrated on the 6th of January. From the Gospel of St. Luke it was known that Christ was born during the night, and therefore divine service was performed in the night of Dec. 24–25, from which circumstance Christmas is called in German *Weihnachten*, a contraction of the old German *se wih nahten*, on the holy or consecrated nights. The feasts of the martyr Stephen and the evangelist St. John were united with it, and a feast of three days' continuance was thus formed. In the ecclesiastical year this festival gives name to a period extending from the first Sunday of Advent to the feast of Epiphany, Jan. 6. In the Catholic Church three masses are performed—one at midnight, one at daybreak, and one in the morning. In the Greek and Roman Churches the manger, the holy family, &c., are sometimes represented at large. Most Christian churches celebrate this great festival in some way. Certain churches, however, as the Presbyterians, do not usually recognize it in its religious aspect, though even among them a tendency towards this form of recognition seems now to be making itself felt. In England and elsewhere business is commonly suspended, in Scotland this is only partially the case. The custom of making presents at Christmas (giving a *Christmas-box*, as it is called, hence the term *Boxing-day* for the day after Christmas) is derived from an old heathen usage; but it has become consecrated by ages, and contributes greatly to make this festival an interesting event to families. The sending of *Christmas cards* by way of friendly greeting and remembrance, though now a well-established practice, and one that causes a great expenditure of money and gives employment to many persons, has grown up only within a period of some fifty years. The Christmas-tree has been traced back to the Romans; it came from Germany to Britain.

CHRISTMAS CAROL, a song in celebration of Christ's birth, sung especially at Christmas-time. Such carols, as well as many of a more secular but always joyous nature, have been long popular among the people of many nations, and nowhere more so than in England. In France they are known as *noëls*, and various good collections of them have been published from time to time. One of the best works on the carols of England is Sandys's Christmas Carols, Ancient and Modern (1833).

CHRISTMAS ROSE (*Helleborus niger*), a well-known garden perennial of the order Ranunculaceæ, with large rose-like flowers, which appear very early in the year; dark, smooth, pedate leaves, and a poisonous, black rootstock.

CHRISTMAS-TREE, a small fir-tree lighted up by means of tiny candles of coloured wax, or small Chinese lanterns, ornamented with flags, tinsel ornaments, &c., and hung all over with gifts for children.

CHRISTOLOGY, that branch of the study of divinity which deals directly with the doctrine of the person of Christ. The term is also used so as to include the doctrine of the work of Christ, strictly a part of *soteriology*.

CHRISTOPHE, HENRY, king of Hayti, was born as a negro slave in Grenada, in the West Indies, in 1767, and was employed in St. Domingo (Hayti) on the outbreak of the blacks against their French masters in 1793. From the commencement of the troubles he took a decided part in favour of independence, and Toussaint-L'Ouverture, the chief of the blacks, gave him the commission of brigadier-general. He commanded at Cape Haytien in 1802, when Leclerc arrived with a French army destined for the subjugation of the negroes; and by the close of 1805 he had driven the French from the island. During the short-lived government of Dessalines, Christophe was general-in-chief of the Haytian army, and in 1807 an assembly convened at Cape Haytien appointed him president for life of the state of Hayti. About the same time a republic was organized at Port-au-Prince, with Pétion at its head. A civil war between the two chiefs ensued, but did not prevent Christophe from taking judicious measures to establish public order in the territory which he governed. Following the example of Napoleon he abolished the republican forms and had himself proclaimed King of Hayti, by the name of Henri I., in 1811. He also sought to perpetuate his name by the compilation of the Code Henri—a digest founded upon the Code Napoléon. He was successful in preventing the French from regaining their authority in the island, but his cruelty and despotism led to an insurrection of his troops, which was aided by Boyer, the successor of Pétion. Perceiving his case to be desperate, and resolved not to gratify the insurgents by becoming their prisoner, Christophe shot himself with a pistol, October 8, 1820.

CHRISTOPHER, ST., a saint whose name and worship are celebrated, but whose history is little known. He is reported to have been a native of Syria or Cilicia, who was baptized by St. Babylas, bishop of Antioch, and received the crown of martyrdom in Asia Minor about the middle of the third century. Relics of him are found in several places, principally in Spain. The Eastern Church celebrates his festival on the 9th of May; the Western on the 25th of July. His intercession was particularly sought in the time of the plague. *Christopher* literally means *bearer of Christ*. He is represented as a giant, bearing the child Jesus upon his shoulders over a stream, which refers to a legend of this saint.

CHRISTOPHER'S, ST. (commonly called *St. Kitt's*), an island in the West Indies, 100 miles N.W. of Guadeloupe, discovered by Columbus in 1493, 23 miles in length, and in general about 5 in breadth, but towards the eastern extremity not more than 3. On the south-east of St. Kitt's, and separated by a channel 2 miles wide, called the Narrows, is the smaller island of Nevis. St. Christopher's has an area of 65 square miles, and produces sugar, potatoes, tomatoes, yams, onions, and other vegetables, as well as pine-apples, bananas, custard-apples, cocoa-nuts, and fruits of various kinds. Probably, however, nearly one-half of the whole island is unfit for cultivation. In the interior are many rugged precipices and barren mountains. Of these the loftiest is Mount Misery (evidently an extinguished volcano), which rises to the height of 4100 feet above the level of the sea. Volcanic action has not entirely ceased here, there being still hundreds of sulphurous jets issuing from the ground, and too hot for the hand to be held over them. Between the sea and Mount Misery is Brimstone Hill, an isolated elevation of 750 feet, formerly a strong fortress. The flora and fauna are similar to those of the West Indies generally, among the latter being a species of small monkey. The climate is considered to be very healthy, and altogether St. Christopher's is a beautiful and attractive island. One of its natural features is a salt pond 2 miles in circumference, near the south-east extremity. This island is divided into nine parishes, Basseterre being the capital, with a population of 8000. St. Christopher's forms one colony with Nevis and Anguilla, there being one executive and one legislative council for all, the colony again being a 'presidency' of the Leeward Islands. The island was colonized by English settlers in 1623. They were shortly joined by some French. After exterminating the aborigines, the two races of colonists quarrelled among themselves, and cultivated different parts of the island, which, however, was given up entirely to the English by the Treaty of Utrecht (1713). The population in 1881 was 29,127; in 1891, 30,876.

CHRISTOPULOS ATHANASIOS, one of the best modern Greek lyric poets, born in 1772 at Kastoria, in Macedonia, was first educated at Bucharest, afterwards studied medicine and the sciences at Pesth, and finally settled at Hermannstadt in Transylvania. An epicurean in every sense of the word, and unconcerned for the fate of his country, he lived only for the gratification of his appetites and celebrated sensual indulgences in his Erotika and Bacchika, or Love and Drinking Songs, which have been several times collected and printed under the title of Lyrika. Though partly modelled upon Anacreon and the songs of Piron, Desaugiers, and other French authors, they display so much ease and simplicity, tenderness and grace, as to give their author a high place among the poets of his nation, and entitle him to the name of the modern Anacreon. He died in 1847.

CHRIST'S HOSPITAL (generally called the *Blue-coat School*, from the costume of the pupils), a school in London, founded by Edward VI., for supporting poor orphans. There used to be from 1000 to 1200 boys and girls at this establishment receiving instruction, board and clothing, the girls being comparatively few in number. The ages varied from eight or ten to fifteen or sixteen, five of the best scholars being sent each year to Oxford and Cambridge. An entirely new scheme of management came into operation in 1891, according to which the preparatory school (established in 1683 at Hertford) has 120 pupils, the boarding-school for boys 700, and the girls' school 350; a day-school for 600 boys, and another for 400 girls, being also provided for. New hospital buildings are being erected at Horsham. Entrance to the Hospital Schools is partly by nomination or presentation, partly by competition; and in regard to two-thirds of the scholars, fees ranging from £10 to £20 may be charged if the parents or relatives are judged to be able to contribute to the child's education and maintenance. Numerous exhibitions and prizes still remain, including exhibitions to the universities. The great hall at Christ's Hospital is a splendid room of great size, and remarkable for some very fine pictures. Camden, Stillingfleet, Coleridge, Charles Lamb, and other distinguished men received their education at Christ's Hospital.

CHROMATE OF IRON. See CHROME IRON ORE.

CHROMATIC, in music, one of the three ancient genera—diatonic, chromatic, and enharmonic. The word *chromatic* has been adopted, as it is believed, because the Greeks were in the habit of designating this genus by characters of various colours; or, as some say, because the chromatic genus is a mean between the other two, as colour is a mean between white and black (this seems to be a very poor explanation); or lastly, because the chromatic genus, by its semitones, varies and embellishes the diatonic, thus producing an effect similar to that of colouring. In modern music the word *chromatic* simply means a succession of semitones, ascending or descending. Thus the expressions *chromatic semitone* (the interval which is found between any given note and that same note raised by a sharp or lowered by a flat), *chromatic scale*, *chromatic modulation*, are terms in use.

CHROME IRON ORE, or CHROME IRONSTONE, is a mineral of very considerable importance as affording bichromate of potash and other useful compounds. It is found disseminated in grains and imperfectly crystallized masses—occasionally in regular octahedral crystals, its primary form—of a black colour, and a shining and somewhat metallic lustre. It scratches glass, is opaque, and has a specific gravity of 4·3. In its pure state it is a compound of the protoxide of iron and the sesquioxide of chromium; but different specimens exhibit deviations from this type, and often contain alumina, magnesia, and other oxides. It is the main source of all the chromium compounds. It is found in Banffshire and Perthshire in Scotland; in Bohemia and elsewhere in Europe; and abundantly near Baltimore, U.S. See CHROMIUM.

CHROMIC ACID. See CHROMIUM.

CHROMIUM. This element was originally discovered in 1797 by Vauquelin, in the native chromate of lead of Siberia (see CROCOISITE). It was afterwards found combined with iron (see CHROME IRON ORE). It is the colouring matter of the emerald and beryl, and has received its name from the brilliant colours of its compounds. Chromium, which has hitherto been procured in very small quantities, owing to its powerful attraction for oxygen, may be obtained by mixing the oxide of chromium with charcoal, and exposing the mixture to the most intense heat of a furnace. It is also got by heating the anhydrous sesquichloride of chromium with zinc, or potassium, or sodium. It is extremely hard, of a grayish-white colour, and less fusible than platinum. Its specific gravity is between 6 and 7. The metal is readily acted on by hydrochloric acid, but less readily by sulphuric, and not at all by strong nitric and by nitrohydrochloric acids. Chromium forms three classes of compounds, the chromous and chromic in which the metal is basic, and the chromic in which it plays the part of an acid.

With oxygen it yields five compounds, chromous oxide (CrO), which forms salts isomorphous with those of iron; an intermediate oxide (Cr_3O_4) resembling the black oxide of iron; the sesquioxide (Cr_2O_3), which is the base of the common chromic salts. This compound has a green colour, is hardly soluble in acids after ignition, and is practically infusible, but when mixed with a flux, such as borax, and heated, it readily melts, imparting to it a fine emerald green colour, and is therefore employed in colouring glass and painting porcelain. It can be obtained by igniting chromate of mercury or of ammonium. A compound of this oxide with water is precipitated when a chromic salt, the sulphate or chloride, is mixed with ammonia. It is a violet-green flocculent or gelatinous body, which when dried is still soluble in acids; but if it be heated, it suddenly becomes incandescent, changes to green, and is insoluble in acids. The remaining oxides are the binoxide (CrO_2), of no importance, and the chromic trioxide or anhydride (CrO_3), the most important of all. In combination with lead oxide it forms the mineral in which the element was first detected. The anhydride is now prepared from a chromate by decomposition with an acid. Usually a cold strong solution of potassic anhydrochromate is mixed with sulphuric acid. On cooling, dark-red prisms of the anhydride separate, and these are laid upon a porous tile to dry. The anhydride is very soluble in water; the solution has strong acid properties, and acts as if it contained chromic acid (H_2CrO_4). This acid combines with a number of bases, giving salts isomorphous with the sulphates, and all distinguished by their rich colours. The best known is the potassic chromate, which is manufactured on a very large scale, and is the immediate source from which the other chromates, and indeed the compounds of chromium generally, are prepared. The manner in which it is formed is as follows:—Chrome iron ore mixed with carbonate of potassium, and sometimes with lime, is roasted for several hours in a reverberatory furnace, with free access of air, until the chromic oxide is converted into the anhydride, which combines with the alkali. The mass is lixiviated with water, and by rapid boiling the potassic chromate is thrown down in granular crystals, which are lifted out, drained, and recrystallized. Formerly chrome iron ore, reduced to fine powder, mixed with half its weight of nitrate of potassium, was heated strongly for an hour or two in crucibles or on a hearth. The resulting masses were then repeatedly digested with water, and the coloured alkaline liquids, saturated with nitric acid, were concentrated by evaporation, till no more crystals of nitre separated. The yellow liquid, being now set aside for a week or two, deposited a copious crop of crystals, the form of which is that of a four-sided prism, terminated by dihedral summits. Their colour is an intense lemon-yellow, with a slight shade of orange; 100 parts of water at 60° dissolve about 48 parts; but boiling water dissolves almost any quantity. This lemon-yellow salt is, however, usually converted into the bichromate or anhydrochromate by adding to the solution the proper amount of nitric, sulphuric, or hydrochloric acid to remove half of the potassium. The bichromate crystallizes in splendid red tabular crystals, which fuse when heated and dissolve readily in water. The aqueous solution of both compounds may be used to prepare the chromates of the other metals by double decomposition. In this way metals give precipitates of different colours; for instance, mercury, an orange red; silver, crimson; bismuth, barium, and lead, a beautiful yellow colour; the last now extensively used as a pigment, under the name of *chrome yellow*. Chrome yellow is largely manufactured in the United States, at Baltimore, near which place is found one of the most remarkable deposits of chrome iron ore in the world. The process consists in adding a solution of acetate of lead (or sugar of lead) to the rough solution of chromate of potassium, from which the nitrate of potassium has been just separated by crystallization. The acetate of lead is added as long as any sediment falls. The liquid is then filtered, and the yellow precipitate left on the filters dried for sale. Chrome yellow is much used in pigment printing on calico. The pattern is printed with the lead salt, and the cloth is afterwards treated with the chromate. By boiling chrome yellow with an alkaline fluid part of the acid is removed, and the colour acquires a deeper orange or even a red tint. In this way orange chrome and palladium red are prepared, and by proper treatment the different tints can be produced on cloth from the original yellow chrome. The drawback to the use of these, as indeed of all lead colours, is the tendency of the lead to combine with sulphur and thus to blacken the pigment. Yellow chromate of zinc is also employed as a pigment. It does not blacken with sulphur.

Chromium combines with most of the elements, but we need only mention its chlorides and sulphates. The chromic chloride (Cr_2Cl_6) is prepared by making an intimate mixture of chromic oxide and carbon, heating this to redness in a porcelain tube, and passing over it a current of dry chlorine gas. Crystalline scales of the chloride sublime. They have a splendid purple colour, and are quite insoluble in pure water. It is easy, however, to obtain a solution of the hydrated chloride by acting on the metal or on the precipitated oxide with hydrochloric acid. It is a purplish green fluid, which when evaporated is apt to decompose with escape of acid. The chromous chloride ($CrCl_2$) is a white mass which dissolves in water, giving a blue solution, and rapidly absorbs oxygen from the air. The least trace of this chloride renders the purple chloride readily soluble in water. The chromic sulphate is got by dissolving the oxide in sulphuric acid, but it is best known in combination with potassic sulphate, as the salt which can be crystallized from a mixture of anhydrochromate of potassium, sulphuric acid, and alcohol. On heating this mixture the colour changes from yellow to purplish green, and the solution on standing deposits dark reddish-purple octahedra, belonging to the regular system, and of remarkable beauty and symmetry. With care they can be produced of great size, and then they appear almost black. From its identity of shape and constitution with ordinary alum this salt is known as chrome alum. The chromous sulphate is only known as a double salt with potassic sulphate. Chromium salts have latterly been used for some time in the tanning of certain kinds of leather. They are also used to some extent as mordants.

CHROMO-LITHOGRAPHY. See LITHOGRAPHY.

CHROMOSPHERE. During total eclipses it is observed that a red-coloured envelope surrounds the sun, and shoots up to great distances from the surface. It seems to have been first recognized by Secchi; and the projecting portions of it are commonly described as 'red-coloured protuberances' and 'red flames.' To this red envelope the name *chromosphere* was given by Mr. (now Sir J. Norman) Lockyer. The light from it is much fainter than that from the photosphere; and till 1868, when M. Janssen and Mr. Lockyer almost simultaneously pointed out a method of viewing it, it was never seen except during eclipses. See SUN.

The spectrum of the chromosphere was first observed in 1868 during the Indian total eclipse, and it was found to consist of a number of *bright* lines, and conspicuous among them those of hydrogen. The light of the chromosphere was thus proved to be due to vast flames or masses of incandescent vapour or gas, hydrogen forming a large part of the whole.

Since the invention of the Janssen-Lockyer method of observing, as it is called, very remarkable advances have been made in our knowledge of solar physics, discoveries quite unthought of having followed. The observations are made by means of a combined telescope and spectroscope. A spectroscope is substituted for the eye-piece of the telescope, the slit of the spectroscope being placed at the principal focus of the object-glass of the telescope. The slit is capable of being moved in such a way that any particular band of the image formed by the object-glass of the telescope may be examined by the spectroscope. The spectroscope employed for the purpose of examining the chromosphere must have the greatest possible dispersive power, and requires for this purpose a very long train of prisms.

As was mentioned above, the spectrum of the chromosphere consists of a series of bright lines. The breadth of a bright line of the spectrum is not sensibly increased by increasing the dispersive power of the spectroscope, but the contrary is the case with a continuous spectrum, which is extended by dispersion. Thus the latter becomes weakened, while the former maintain their brightness, and become more visible in comparison with the others. The slit of the spectroscope being arranged so as to take in a band, either tangential or radial, close to the edge of the image of the sun formed by the object-glass of the telescope, it is found that the bright lines of the chromosphere are perfectly visible, in spite of the light of the continuous spectrum proceeding from the inner portion of the disc. Farther, it has been found possible, by using a spectroscope of the very highest dispersive power, and by opening the slit sufficiently wide, to see the whole of one of the protuberances at once, and by this means to watch its motions and its changes. To understand this the reader must consult the article SPECTROSCOPE. He must recollect that a continuous spectrum consists of an enormous number of images of the slit, placed side by side, and in ordinary cases slightly overlapping each other. If we could employ an infinitely narrow slit we should have an infinite number of infinitely narrow images, and no overlapping whatever. But suppose a light to consist of only two or three colours, say light from a source only capable of giving the two bright lines C and F, that is, one in the red and another in the blue part of the spectrum. It is easy, even with a slit of sensible width, to keep the two from overlapping, and we shall see without any confusion the two bright lines or bands at different parts of the spectrum, darkness intervening. Now imagine a flame or tongue of fire starting up from the sun's surface, and let the spectroscope be directed on its image in the telescope: there will be only portions of the slit illuminated by it, portions corresponding to the shape of the flame; and if the flame contain only light of the bright line C and F, there will be seen two images of the flame at the points of the spectrum belonging to these colours. The observation of these flames by Mr. Lockyer has furnished us with what may be considered at present as a very complete knowledge of the atmosphere of the sun, though doubtless there is yet much to be discovered by the daily observation of them that is now carried on; and the same method applied to the sun's spots has proved not less fruitful. We can only give a few of the results here, but the reader will find an account full of interest in Mr. Lockyer's papers communicated to the Royal Society, and printed in abstract in the Royal Society's Proceedings for 1869 and 1870. He will also find in the Proceedings for the same date an account of the experiments of Frankland and Lockyer on gaseous spectra, undertaken with the view of determining some questions of great importance relating to phenomena observed in the course of the researches under consideration. Latterly, by methods specially devised, excellent photographs of the protuberances or flames have been obtained.

The chromosphere and its prominences, when examined with the telespectroscope (as the instrument just described is called), exhibits, as we have said, a spectrum of bright lines, due to incandescent gases. The most elevated portions consist entirely or almost entirely of hydrogen, the lightest of the gases. Lower down are found the gases or vapours of the heavier metals—of sodium, magnesium, barium, iron, and others. The lower the layer of the chromosphere examined the more dense is the spectrum filled with lines of metals, and in the prominences the red hydrogen flames tower high above all.

From minute displacements of well-known lines in the spectrum (the reader should refer to the article SPECTRUM ANALYSIS) motions are inferred of the incandescent bodies from which these lines are proceeding. On this principle motions of the fixed stars have been determined. Thus Sirius is receding from us at the rate of 20 miles per second, while Arcturus is approaching us at the rate of 50 miles per second. The principle applied to the results of the spectroscopic examination of the prominences of the chromosphere shows that they are due to enormous outbursts of gases and vapours from the sun. These gases are projected outwards with extraordinary velocity, and in their neighbourhood vast cyclones are observable. It is also proved by applying the same principle that the spots on the sun's surface are due to, or at least are accompanied by, vast up-rushes and down-rushes of gaseous matter.

We regret that our space does not allow us to say more on this very interesting subject. The reader will find the best information in the original papers of Lockyer and Frankland above referred to, and, with respect to the motion of the fixed stars, in the papers of Sir W. Huggins, also published in the Royal Society's Proceedings.

CHRONIC (from Greek *chronos*, time), a term applied to diseases which are of long duration, and mostly without fever. It is used in opposition to the term *acute*, which is applied both to a pungent pain and to a disease which is attended with violent symptoms, terminates in a few days, and is attended with danger. On the other hand, a *chronic* disease is slow in its progress, and not so generally dangerous.

CHRONICLE, strictly speaking, is a history digested according to the order of time. In this sense it differs but little from *annals*. The term is mostly used in reference to the old histories of nations written when they were comparatively rude. Chronicles belong to the sources of history, and many have been handed down from early ages; for instance, the two books of the Chronicles of the Hebrews, which belong to the Old Testament. With many nations such chronicles were written under the authority of government; and priests being the only men of learning among uncultivated tribes they were intrusted with this office. In the early Christian ages also ecclesiastics were generally the authors of the chronicles; for example, Eusebius, bishop of Cæsarea, collected from other historical works his Chronicle of ancient history. Hieronymus of Stridon translated it into Latin in the fourth century, and others continued it. Many historical works of the Byzantine historians are also chronicles. We might mention likewise the Alexandrine chronicle (*Chronicon paschale*), published by Du Fresne; also the chronicles written by monks, particularly by the diligent Benedictines in the middle ages, some of which embraced the whole history of the world from its beginning to their own time (as the Chronicle of Regino, of Otto of Freisingen, &c.); others the history of a certain period (as Liutprand's History of his Time, from 891 to 946), or of a single nation (as the History of the Franks, by Gregory of Tours; that of the Lombards, by Paulus Diaconus; the Anglo-Saxon Chronicles, &c.), or the history of single provinces, cities, and institutions (as the Chronicle of the Abbey of St. Denis; the Chronicle of Cologne); also the history of individuals (as Eginhard's History of Charlemagne), and of single events.

These chronicles bear the impression of their time, displaying the ignorance and credulity of their authors, and abounding in religious and moral reflections. The chronicles of the middle ages were not written with the purpose of supporting certain political principles, but generally give simple facts; on account of which they are preferable as historical records to many modern works.

CHRONICLES, BOOKS OF, the last of the historical books of the Old Testament, forming only one book in the Hebrew canon. Its arrangement after the Books of Kings, and its division into two parts, is the work of the *Seventy* (see SEPTUAGINT). The Hebrew name means *words* or rather *acts of the days*, and is thus much the same as our 'journals' or 'annals'. The title given to it by the Seventy was *Paraleipomena*, meaning either 'remains' (of other historical works), or 'things omitted'. The usual and very appropriate name Chronicles was given to it by Jerome. According to its contents the book forms three great parts:—1. Genealogical tables interspersed with geographical, historical, and other remarks (1 Chr. i.–ix.). 2. The history of the reigns of David and Solomon (1 Chr. x.—2 Chr. ix.). 3. The history of the kingdom of Judah—excluding that of Israel—from the separation under Rehoboam to the destruction of the Jewish state by the Chaldeans (2 Chr. x.–xxxvi.), with a notice in the last two verses of the permission granted by Cyrus to the exiles to return home and rebuild their temple. The Chronicles accordingly traverse nearly the whole field of Old Testament history, and present many points of contact with the earlier scriptures, historical and prophetical, more especially, however, with the books of Samuel and of Kings. How far the author of the Chronicles may have made use of these books cannot be determined, but that he did not solely rely upon these is evident from the number of titles of books referred to by him as authorities, sometimes on matters not contained in Samuel and Kings, or, if mentioned in them, yet with greater brevity than in the Chronicles. A considerable portion of the matter contained in the Chronicles is much the same as that in Samuel and Kings, but many particulars recorded in these books are entirely passed over, while others are more fully related in the Chronicles. A certain quantity of matter also is peculiar to the Chronicles. That the Chronicles form one of the latest compositions of the Old Testament cannot admit of doubt. Its reference, already mentioned, to the decree of Cyrus respecting the restoration is sufficient evidence of this. With regard to the author there is not the same certainty, but strong arguments can be adduced to prove that Chronicles and the book of Ezra are by one hand, and a common opinion is that Ezra was the author of both.

CHRONOLOGY (compounded of the Greek *chronos*, time, and *logos*, discourse) is the art of measuring time, distinguishing its several constituent parts, such as centuries, years, &c., by appropriate marks and characters, and adjusting these parts in an orderly manner to past transactions, by means of eras, epochs and cycles, for the illustration of history. The principal means for marking the divisions of time are afforded by the motions of the heavenly bodies, particularly the sun and the moon, which produce the natural division of time into years, months, and days. The necessities of life requiring still smaller and more precise divisions of time (which can be measured only by artificial means), gave rise to hours, minutes, and seconds. This division of time is called the *artificial*. Even in the natural division, however, there is something arbitrary, as it depends solely on the will what point in the motions of the heavenly bodies shall be taken as the point of beginning; for example, in the annual rotation of the earth, whether we shall take the longest day of summer or the shortest day of winter. The first lawgivers therefore fixed the civil beginning and end of the month, day, and year, and at the same time also the smaller divisions of these larger portions of time. From this separation of the natural and artificial or civil division of time arises a division of chronology into mathematical, astronomical, and historical. Astronomical chronology determines the duration of the natural portions of time by the revolutions of the heavenly bodies; historical chronology treats of the civil divisions of time, of the methods of reckoning time among different nations, of ancient periods or remarkable epochs, &c. It is obvious that each of these divisions of chronology requires the assistance of the others All historical chronology is grounded on the astronomical, which cannot determine the duration of the periods of time without the aid of the civil division. Mathematicians and astronomers determine the natural periods of time as they are indicated by the motions of the sun and moon. It is left to legislators to determine by law on what day the year shall begin, how many days shall constitute a month, how many a week, &c. This civil regulation is the foundation of the calendar (which see) or almanac. Thus far must astronomical chronology be connected with historical; but the latter only can teach us the divisions adopted by different people. Historical chronology explains (1) the form of the year among different nations, as it is regulated by lawgivers, founders of religions, and other founders of civil society; (2) those events which are selected by different nations as eras, that is, as points from which they begin their reckoning; for example, the Yugs of the Hindus; the era of Nabonassar, the era of the Seleucidæ, among the Chaldeans, Syrians, Persians, Egyptians; the creation of the world among the Jews; the birth of Christ among Christians; the Olympiads among the Greeks; the building of Rome and the consular era among the Romans; the Hegira or flight of Mohammed among the Mohammedans, &c. As so many different eras render the reckoning of time difficult, it (3) selects a form of the year and an era to which it refers those of other nations, and by which it arranges the history of all nations and times. The European chronologist and historian must refer the eras and years of all peoples to those used in modern Europe. See Hales' Analysis of Chronology; Blair's Chronology; Playfair's Chronology; the Encyclopædia of Chronology, by Woodward and Cates; the Art de Vérifier les Dates, by the Benedictines of St. Maur, &c. See also the articles on Calendar and Epoch.

CHRONOMETER, a time-piece of a peculiar construction employed in determining the longitude at sea. In general, chronometers are much larger than common watches, and are hung in gimbals, in boxes 6 or 8 inches square; but there are also many pocket chronometers, which, externally, have all the appearance of the better sort of pocket watches, and internally differ from these only in the construction of the balance. The balance and hair-spring are the principal agents in regulating the rate of going in a common watch, being to this what the pendulum is to a common clock; and this spring, in the former, like the pendulum in the latter, is subject to expansions and contractions under different degrees of heat and cold, which of course affect the speed or rate of the machine; and the methods of correcting this inaccuracy mark the difference between the watch and chronometer. The first experiment with a chronometer was made by Major Holmes in a voyage to the Guinea coast in 1665, with a watch by Huyghens. In 1726 Mr. Harrison produced a chronometer which did not vary a second in ten years. Chronometers are employed now on almost all ships sailing any distance from the land; some vessels bound for a long voyage carry more than one for the purpose of checking, and to guard against the effects of accidental derangement in any single one. See Clockwork.

CHRONOSCOPE. An ingenious instrument, due to Sir Charles Wheatstone, for the purpose of estimating the duration of certain luminous phenomena, such as the electric spark, which, according to ordinary means of measurement, appear absolutely instantaneous. It is founded on what is known as *persistence* of the impression on the retina of the eye. When a burning stick is whirled rapidly through the air a line of light is seen, the impression that the eye receives from the bright point in one position remaining long after the point has moved to a new position. Wheatstone views the electric spark in a small steel mirror revolving with enormous, but measured, velocity, and having a motion arranged, so that, were the light permanent, the object would appear to describe a complete circle. If then the phenomenon be *instantaneous*, a mere point of the circle will be seen, but if it have a duration shorter than the time of a revolution of the mirror, but still not infinitely short, the image will stretch out into an arc of the circle proportionate in length to the duration. The principle has been employed to show the *discontinuity* of certain flames which from persistence of vision appear continuous. These, when viewed in a mirror revolving rapidly, appear as a number of points or streaks of light arranged at intervals along the circle.

CHRUDIM, a town, Bohemia, capital of circle of same name, 62 miles S.E. of Prague, beautifully situated on the small river Chrudimka. It is surrounded with walls, and contains an old church, a Capuchin convent, and a royal high-school. It is the seat of the government of the circle, and has manufactures of cloth. The horse markets held here are the most important in the empire. Pop. (1890), 12,128.

CHRYSALIS. See Butterfly.

CHRYSANTHEMUM, a genus of composite plants of the group or sub-order Corymbiferæ, consisting of herbaceous or slightly shrubby annuals or perennials, having a hemispherical involucre composed of imbricated scales membranous at the edges, large naked receptacle, fruit without pappus. The native British species are *C. leucanthemum* (ox-eye daisy), bearing a large flower-head with white ray and yellow disk, common in pastures; and *C. segetum* (corn marigold), with large yellow flowers and leaves of a glaucous green hue, abundant in corn-fields, often so much so as to be a pest to the farmer. Many species are now in cultivation as ornamental plants, brought from various parts of the world, but none are so much in favour as *C. sinense*, the Chinese (and Japanese) chrysanthemum, which has given rise to a great number of varieties, some of them with flower-heads of extraordinary size and the greatest beauty of form and colour. The plant is easily cultivated, and provides abundance of blossom in November and December, only requiring protection from frost. The chrysanthemum is the national flower of Japan. It is often placed in the genus *Pyrethrum*, to which feverfew belongs.

CHRYSES, a priest of Apollo, who, according to Homer, came to the Grecian camp to ransom his daughter Chryseis, who had become the prize of Agamemnon.—Another Chryses was the son of Neptune and Chrysogeneia, and the father of Minyas.—A third Chryses was the son of Minos and the nymph Pareia. He lived on the island of Paros with his brothers Eurymedon, Nephaleon, and Philolaus, and was put to death by Hercules because he had, in concert with them, murdered two of his companions.—A fourth Chryses was a son born by Chryseis to Agamemnon after her return to her father, but alleged by her to be the son of Apollo. He assisted his step-brother and step-sister, Orestes and Iphigenia, in murdering King Thoas.

CHRYSIPPUS, a Stoic philosopher of Cilicia, distinguished for his skill in disputing. He was the principal opponent of the Epicureans, and is said to have written 700 different works, mostly of a dialectical character; but of these no complete work is extant. He died at a great age about 206 years B.C.

CHRYSOBERYL (sometimes called *cymophane*, and, by the jewellers, *oriental chrysolite*) was for a long time only known as occurring in semi-transparent rounded pieces, in the alluvial deposits of rivers, along with other species of gems. Thus, in Brazil it was found along with the diamond and topaz, and with rubies and sapphires in Ceylon. Distinct crystals were afterwards brought from Siberia, and large crystals are said to occur in mica slate on the bank of the river Takowaja. It exists in beautifully distinct crystals at two places in the United States—at Haddam (Connecticut), and Saratoga (New York). They are found at both these localities in a granitic rock. The form of the crystal is, for the most part, a rectangular prism and a low six-sided table (with re-entering angles), formed by the crossing of three prismatic crystals. Chrysoberyl scratches quartz, is of an olive-green colour and vitreous lustre, and is often possessed of a bluish opalescence; specific gravity, 3·754. It is composed of alumina, 68·66; glucina, 16·00; silica, 5·99; protoxide of iron, 4·73; and oxide of titanium, 2·66. Sometimes chromium, lead, and copper are found in it. It is used for making jewelry.

CHRYSOCOLLA, a hydrated silicate of copper, containing besides, ferrous oxide, lime and magnesia. It forms reniform or stalactitic masses, is of an emerald colour and resinous lustre. Specific gravity, 2·2. Not very hard. It is met with in the Leadhills, in Cornwall, and Westmoreland, at many places on the Continent, and in America, accompanying malachite and other copper minerals. The chrysocolla of the ancients, meaning 'gold glue,' was apparently a body used to facilitate soldering. If not actually microcosmic salt, it consisted of phosphates, obtained as that salt was originally obtained. When heated with the alloy or with copper the chrysocolla became green, and its name was then applied to green coloured minerals, and probably to the carbonate of copper which was got native. It seems also to have been given to an artificial mixture of copper and the above-mentioned phosphates. The whole subject is still open to discussion.

CHRYSOLITE, a greenish, yellowish, or brownish stone, sometimes transparent, sometimes only translucent, which possesses the power of double refraction in a high degree. It is composed of silica, magnesia, and iron, and is a variety of olivine. The chrysolite employed in the arts comes chiefly from the Levant, and is sometimes used in jewelry, but is not highly esteemed. It is so soft, that is rather apt to wear and become dull. This quality also serves to distinguish it from sapphire and other gems, with which it has been confounded. Werner thinks that the yellow chrysolite of the ancients is the modern topaz. Some specimens have also yielded manganese and nickel.

CHRYSOLORAS, MANUEL, a distinguished Greek of Constantinople, born about the middle of the fourteenth century, the first who, in modern times, transplanted Greek literature into Italy. The Emperor John Palæologus sent him in 1391 to Italy and England to ask for assistance against the Turks. Having thus become known in Italy he returned there about the year 1395, and was appointed professor of Greek literature at Florence. He remained about three years in Florence, where he collected around him a great number of scholars of all ages and ranks, and excited universal enthusiasm as much by his dignity and the grace of his elocution as by the extent of his learning. From his school proceeded Leonardo Bruno, Poggius, Francis Philelphus, and other distinguished revivers of classical studies. He afterwards taught with equal success at Milan, also at Pavia and Venice, and lastly at Rome. Pope Gregory XII. employed him in public affairs, and sent him with others to the Council of Constance, where he died in 1415. He should not be confounded with his nephew and companion in Italy, John Chrysoloras.

CHRYSOPHANIC ACID. The yellow colouring matter of rhubarb. It can be got direct from rhubarb by exhausting with benzol, and purifying the crude product. It crystallizes in fine yellow tables. It is hardly soluble in water, but dissolves in ether, benzol, &c. With potash it gives a fine purple solution, and thus affords a delicate test for the presence of alkalies. It is also soluble without decomposition in strong sulphuric acid. Its acid properties are rather obscure.

CHRYSOPRASE, a variety of chalcedony coloured with nickel, is never found crystallized. It is not quite so hard as quartz. It is used on the Continent for making trinkets and fancy articles. Its colour is said to fade in the light, but to be restored or improved by washing with a salt of nickel.

CHRYSOSTOM, JOHN, ST., a celebrated father of the church, born in Antioch about the year 344. Secundus, his father, who had the command of the imperial troops in Syria, died soon after the birth of his son, whose early education devolved upon Anthusa his mother. In those times eloquence was still the means of obtaining the highest honours in Greece. Chrysostom studied this art with Libanius, the most famous orator of his time, and soon excelled his master. After having studied philosophy with

Andragathius he devoted himself to the Holy Scriptures, and determined upon quitting the world and consecrating his life to God in the deserts of Syria. At the age of twenty he conducted a legal case with extraordinary success; but he soon retired from public business, and by fasting and penance endeavoured to obtain the mastery of his passions. He remained three years in Antioch. He was united by the ties of an intimate friendship with Basil Theodore, afterwards bishop of Mopsuesta, and with Maximus, subsequently bishop of Seleucia. Theodore having quitted for a time his holy vocation, Chrysostom wrote two beautiful exhortations in order to recall him to his duty. The bishops of the provinces had determined on electing him or Basil as bishop; but Chrysostom fled and concealed himself; consequently Basil was elected, who complained, however, much of his friend's withdrawal. Chrysostom defended himself in his beautiful work on the office of priests.

In 374 he retired to the anchorites who dwelt on the mountains in the vicinity of Antioch; and after living with them for four years quitted them to seek a still greater seclusion. He dwelt in a cavern, where he remained two years without lying down. His penance and wakefulness, together with the dampness of his abode, threw him into a severe illness, which forced him to return to Antioch (381). In the same year he was appointed deacon by the Bishop of Antioch, and in 386 consecrated priest. He was chosen vicar by the same dignitary, and commissioned to preach the Word of God to the people. Till then the bishops only had instructed the people in the gospel. His eloquence attracted Jews, heathens, and heretics. He was, says Sozomenes, the ornament of his church and of the whole East, when the Emperor Arcadius determined, in 397, to place him in the episcopal see of Constantinople. To prevent the inhabitants of Antioch from opposing his intentions, the emperor caused him to be secretly conveyed to Constantinople, where Theophilus, patriarch of Alexandria, ordained him. He commenced his official labours by limiting the expenses of his house, founded and supported hospitals, improved the morals of the clergy, and converted a number of heathens and heretics. He gave so generously to the poor that he was universally called *John the Almsgiver*. He devoted himself to attendance on the sick. He sent bishops as missionaries to the Goths, to the Scythians, and to Persia and Palestine. His eloquence twice prevented an insurrection.

In 399 Chrysostom held a council in Constantinople, at which several Asiatic bishops were deposed as guilty of simony. Severin, bishop of Gabala, in Syria, dared to attack Chrysostom from the pulpit, and to stir up the people against him; but his charges were rejected as calumnies. Chrysostom had two dangerous enemies—the Empress Eudoxia, whose injustice and extortions gave cause to many complaints; and Theophilus, patriarch of Alexandria, who was jealous of his influence. The latter assembled several bishops at Chalcedon, who were to investigate the complaints made against Chrysostom. But he refused to appear, alleging that they had acted against the laws of the church. His removal was determined upon, and sanctioned by Arcadius, who banished him from the country. Chrysostom quitted the city secretly, and purposed retiring to Bithynia; but the people threatened a revolt. In the following night an earthquake gave general alarm. In this dilemma Arcadius recalled his orders, and Eudoxia herself invited Chrysostom to return. The people accompanied him triumphantly to the city, his enemies fled, and peace was restored, but only for a short time. A feast given by the empress on the consecration of a statue, and attended with many heathen ceremonies, roused the zeal of the archbishop, who publicly exclaimed against it; and Eudoxia, violently incensed, recalled the prelates devoted to her will, and Chrysostom was condemned although forty bishops declared themselves in his favour. Pope Innocent I. and the Emperor Honorius declared themselves in favour of Chrysostom, but Arcadius refused to assemble the council on which the others insisted, and commanded Chrysostom peremptorily to retire to the place of his banishment. He obeyed, and was conveyed to Nicæa in Bithynia (404). Soon after his departure the church and the palace where the senate used to assemble became a prey to the flames. Many works of art were lost in this conflagration, which the emperor attributed to the friends of Chrysostom. The Isaurians and Huns laid waste the empire. Chrysostom's return was universally desired; Arcadius remained inflexible. Eudoxia died soon after Chrysostom's banishment, after having fixed upon the little Armenian town Cucusa, in the wilds of Taurus, for his abode. Exhausted by sickness, deprivations, and the fatigues of his journey, he arrived there, and continued to exert his pious zeal. He sent missionaries to Persia and Phœnicia, and wrote seventeen letters to Olympias, all of which are moral dissertations. He likewise addressed to her his work entitled, None can Injure Him who does not Injure Himself. All christendom beheld the pious sufferer with love and admiration; at which the emperor, exasperated, commanded him to be conveyed to the shores of the Pontus Euxinus, to the town of Pityus, situated on its most distant borders. The officers who had him in charge obliged the old man to perform his journey on foot, with his head uncovered in the burning heat of the sun. This harsh treatment was the cause of his death, which took place at Comana in Pontus in 407. His body was interred at the side of that of St. Basil; but in 438 it was conveyed solemnly to Constantinople, and there interred in the Church of the Apostles, in the sepulchre of the emperor. At a later period his remains were placed in the Vatican at Rome. The Greek Church celebrates his feast on the 13th of November, the Roman on the 27th of January.

The name of *Chrysostom* (golden-mouthed) was assigned to him after his death, to express the eloquence which he possessed in a much greater degree than the other fathers of the church. He never repeats himself, and is always original. The vivacity and power of his imagination, the force of his logic, his power of arousing the passions, the beauty and accuracy of his comparisons, the purity of his style, his clearness and sublimity, place him on a level with the most celebrated Greek authors; the Christian church has not a more accomplished orator. The most accurate Greek edition of his works is that of Henry Saville (1612, nine vols. folio); the most complete Greek and Latin is that of Montfaucon (Paris, 1718–38, thirteen vols. folio, reprinted 1834–40).

CHRYSOSTOM, Dion (surnamed *Cocceianus*), born at Prusa in Bithynia in the end of the first century, was first a Sophist, then a Stoic, and rose into high repute as an orator under Domitian. That tyrant, however, took offence at his freedom of speech, and he was obliged to save himself by flight. He was afterwards highly esteemed by Nerva and Trajan. About eighty of his orations are still extant. They labour under the faults of the time, and are written in an affected style, but notwithstanding form a valuable contribution to our knowledge of ancient philosophy. They appeared first in a collected form at Milan in 1476.

CHUB (*Leuciscus Cephalus*), a fresh-water fish of the carp family, found in almost all the slow-running, soft, and clear rivers in England, and of the Continent as far north as Sweden, and a part of Finland, also in the United States; is somewhat rare in the northern streams of Scotland, and absent from those of Ireland. The most esteemed part of this fish is the head, the stoutness or thickness of the sides of which appears to have given occasion to the name in all languages; in old English it is called *cop*, in French *testard*, in Latin *capito*, in Italian *capitone*. The body is oblong, rather round, and of a pretty equal thickness in the greater part of the slope. The scales are extraordinarily large; the head and back of a deep dusky green; the sides silvery, but in summer yellow; the abdomen white; the pectoral fins of a pale yellow; the ventral and anal fins red; the tail forked, and of a brownish hue, tinged with blue at the end. The flesh is of but little value, being coarse and full of small hairy bones. Like the generality of carps the chub feeds much on vegetables, but it eagerly devours insects, being especially fond of the Spanish-fly; it readily bites the hook when baited with a worm or molluscous animal. It prefers streams with a plentiful supply of water running over a bed of sand or gravel, and possessing shady pits or deep recesses to which this shy and timid fish can retreat on the first appearance of danger. Although the average weight of the chub is little over half a pound, yet specimens have been found weighing 5 lbs.

CHUBB, THOMAS, a writer in humble life, who obtained great temporary distinction as a controversialist. He was born at East Harnham, near Salisbury, in 1679, and was instructed only in reading, writing, and accounts. He was apprenticed to a glover, but at length became journeyman to a tallow-chandler, and employed his leisure in the acquisition of knowledge from the best English books which he could procure. In 1715 he published The Supremacy of the Father Asserted, &c., the perspicuity and argumentative skill of which obtained for it much notice. Of course a production rudely assailing the orthodox faith did not pass without reply, and a controversial warfare commenced which lasted as long as his life. In 1730 he offered to the world his thoughts on a variety of topics, moral and theological, in thirty-four tracts, collected in a 4to volume, of which book Pope in a letter to Gay speaks with great respect. Various publications followed, for example, A Discourse Concerning Reason, The True Gospel of Jesus Christ Asserted, Inquiry into the Ground and Foundation of Religion, &c. In all of these he came openly forward as the advocate of deistical principles, and the assailant of our Saviour's divinity. His writings scarcely deserve the notice which they at one time attracted, and have almost sunk into oblivion. He died suddenly in February, 1747.

CHUBB-LOCK, so called from the name of the inventor, one of the most intricate of the many-tumbler locks, which were first made in this country by Barron in 1774. The locks of Chubb have obtained their celebrity partly from their superior workmanship, having more tumblers than usual, with the addition of a lever called the *detector*, which is so fixed that while it does not act under the ordinary application of the key, yet cannot fail to move if any one of the tumblers be lifted a little too high, as must be the case in any attempt at picking. The bolt becomes immovably fixed, and thus, while rendering all further attempts at picking useless, gives notice that such an attempt has been made on the next application of the proper key. To draw the bolt after it has been tampered with it is only necessary to turn the key a little farther forward, as in the process of overlocking; this pushes up a tooth at the end of the detector, restoring the lock to its original position, and the key is then free to turn in the ordinary way. These locks, which were patented as far back as 1818, maintained the reputation of being invincible until the celebrated locksmith Mr. Hobbs from America in 1851 succeeded in picking the most intricate kinds of English workmanship, such as Chubbs, Bramahs, and Cotterills.

CHUDLEIGH, a town, England, county of Devon, 8 miles south-west of Exeter, situate on an eminence, near the left bank of the Teign, amidst picturesque scenery, consists principally of one street of substantial houses. It has an interesting church, several chapels, nunnery, grammar-school, &c. In 1807 it was nearly destroyed by fire. Pop. (1891), 2003.

CHUMBUL, a large river, Hindustan. It rises in Malwa, in the Vindhya Mountains, about 50 miles south of Oojein, flows north, enters Rajpootana, through which it runs north-east, and falls into the Jumna about 90 miles south-east of Agra, after a course of over 650 miles.

CHUNAR-GHUR, a town, fortress, and invalid station, Hindustan, North-west Provinces, 17 miles south-west of Benares, on the right bank of the Ganges, here navigable for craft of 50 to 60 tons. The fortress stands on a lofty rock rising abruptly from the river, and presents a bold and picturesque appearance when viewed from the water. In the last inclosure, on the very summit of the mountain, which is calculated to make a defence even should all the lower works have fallen, are several very interesting buildings; one of them is the old Hindu palace, a central dome surrounded by several vaulted apartments. Chunar was stormed by the British in 1764, and formally ceded to the East India Company in 1768. Pop. (1891), 11,423.

CHUPRAH, or CHAPRAH, a town, Hindustan, in Bengal, on the Gogra, near its junction with the Ganges, 32 miles W.N.W. of Patna. It is narrow, but extends along the river for four miles. It has government courts and offices, government English school, and is a station of the German Lutheran Mission. Pop. (1881), 51,670; (1891), 57,352.

CHUQUISACA, or SUCRE, a city of South America, and the capital of Bolivia; pop., partly Indians, about 24,000. It stands on a plateau 9343 feet above sea-level, and is surrounded by heights, which defend it from all winds. The temperature in summer is very mild, nor is there any considerable difference throughout the year. The houses have one story besides the ground-floor. They are covered with tiles, and are very roomy and convenient, with delightful gardens, planted with European fruit-trees; but water is so scarce as hardly to supply the necessary purposes of life, and is brought from the several public fountains dispersed in the different parts of the city. The town had the name of *La Plata* from its being built near silver-mines. It was founded by one of Pizarro's officers in 1539, was erected into a bishopric in 1551, the place having then the title of *city*, and in 1608 was raised to an archbishopric. The cathedral is large, of good architecture, and finely adorned with paintings and gildings. The city has also a university, dedicated to St. Francis Xavier. The province of Chuquisaca has an area of 72,796 square miles, and a population of 286,000, most of whom are of Indian blood.

CHUR. See COIRE.

CHURCH. This word probably comes from the Greek *kyriakos*, dedicated to the Lord; the Scottish *kirk* and German *kirche* are forms of the same word. It has various meanings; in its widest since it denotes the whole community of Christians, and was thus used by the New Testament writers. In more restricted significations it denotes a particular section of the Christian community differing in doctrinal matters from the remainder, as the Roman Catholic

Church, the Protestant Church, &c.; or to designate the recognized leading church of a nation, as the English, Scotch, or French Church. It is applied in a sense which is manifestly too narrow, when it denotes merely the officers of the church, or clergy. In yet another sense it signifies the building in which Christians assemble for the worship of God, and, referring the reader to the separate articles on the sects into which the community is divided, we shall confine ourselves here to a few remarks, historical and descriptive, on *church* as denoting the edifice appropriated to Christian worship. When in the time of Constantine the persecuted Christians emerged from their meeting-places in upper rooms and in the Roman catacombs to bask in the sunshine of imperial favour, no buildings could be found fitter for their purposes than the basilicas of Rome. The basilica was generally in the form of a parallelogram, with a semicircular apse at one end, which was raised, being approached by a semicircular range of steps. In the centre of this apse was the raised seat of the quæstor or other presiding magistrate; on each side, upon the steps, were places for the assessors, or those engaged on the business being transacted. In front of the apse was placed an altar, where sacrifice was performed before undertaking public business of any importance. The area of the building was divided by two rows of columns, the central division or nave being by far the broadest; over the two smaller divisions or aisles a gallery was often raised. In the small and dark Pagan temple there was neither room nor light enough to conduct Christian worship, but in such a building as above described, the whole congregation of the faithful could meet and take part in the act of worship. The bishop naturally took the place of the quæstor, the presbyters that of the assessors. The altar on which the pious Pagan poured his libations at the commencement of important business served equally well for the celebration of Christian rites. When in course of time the separation between laity and clergy became complete, the apse was railed off and appropriated to the use of the clergy, then the raised part on which the altar stood was separated by pillars called *cancelli*, and not allowed to be profaned by the multitude. Another change was the introduction of a choir, or inclosed space in the centre of the nave, round three sides of which the faithful congregated to hear the gospel read from two pulpits built into its inclosure on either side, or to hear the services read or sung by the inferior clergy, who occupied its precincts. As time wore on other modifications were introduced; on the erection of new buildings the symbolic form of the cross was generally adopted as the most suitable for a Christian building; the arms of the cross (the transept) were railed off by rows of columns as the main building had been; at the point of intersection of the transept with the nave a tower was raised, which was at times surmounted by a small spire; frequently two towers were placed at the angles of the entrance end of the edifice. Over the greater part of Europe the style which came to be usually adopted for ecclesiastical buildings was the pointed Gothic, as lending itself more readily to a more majestic and ornamental treatment than the graceful Greek with its columned portico and rounded tower. Circular churches, which were popular at an early date, have found little imitation. The structures which are among the most notable in point of size or historic interest are alluded to in the article on Cathedrals. The ordinary churches of Great Britain are generally long rectangular buildings, without transepts, and the tower is placed so as to form the principal entrance, or at one of the angles of that end of the church. Of late years a taste for a superior style of building to that hitherto prevalent has sprung up even among the dissenting bodies in England and the Presbyterians of Scotland. See Architecture.

CHURCH, Fathers of the (*patres ecclesiæ*), teachers and writers of the ancient church, who flourished after the time of the apostles and apostolic fathers (the immediate disciples of the apostles), from the second to the sixth century. This name is also sometimes given to the teachers and writers of the following centuries, down to the schoolmen, who begin with the twelfth century. A large number of their writings have been preserved, and have been published by modern scholars. The knowledge of their lives and their works constitutes a particular science, called *patristics*. The fathers of the church introduced the Greek and Roman learning into Christian treatises, and many of them were as able as they were learned. Most of the earlier fathers of the church, before their conversion to Christianity, were rhetoricians or advocates, which accounts for several peculiarities, as well in their method of disputing as in their style. The object of their writings is to defend the Christian religion and the Christian community, refute the Jews, pagans, and heretics, explain the Holy Scriptures, set forth the doctrines of their faith, and the rules of their morality, also the history of Christianity and the Christian church, and impart instruction to the people. The contents of these writings, therefore, are apologetic, exegetic, dogmatic, moral, historical, polemical, or ascetic. The fathers of the church are divided into two chief classes—Latin and Greek. The most celebrated among the Greek fathers are Clement of Alexandria, the first who philosophized on Christianity; Origen, distinguished for his homilies and his apologetic and exegetic writings; Eusebius, who wrote the first history of Christianity; Athanasius, who had a decided influence upon the formation of the Christian dogmas; and Chrysostom, the most admired of the ancient Christian orators. The most distinguished among the Latin fathers are Tertullian, a writer of great originality; Augustine, a man of a peculiar and vehement mind, the oracle of the Western Church; Ambrose, distinguished as a Christian orator; and Jerome, a man of much learning, and particularly happy in explaining the Holy Scriptures, whose efforts, however, contributed much to awaken in the West an admiration for the renunciation of the world and the celibacy of priests. Migne's Patrologiæ Cursus Completus gives the works of the fathers and many later writers in 388 vols. Translations are contained in the Library of the Fathers of the Holy Catholic Church, edited by Pusey, Keble, and Newman; and in the Ante-Nicene Christian Library. See also Farrar's Lives of the Fathers (2 vols).

CHURCH, Greek. See Greek Church.

CHURCH, Latin, or Western. See Roman Catholic Church.

CHURCH, Roman Catholic. See Roman Catholic Church.

CHURCH, States of the, the pope's dominions in Italy. They originated with the grant of Pepin, king of the Franks, in 754, who bestowed on Stephen III., bishop of Rome, some districts which the Lombards, against whom Stephen II. solicited Pepin's assistance, had taken from the exarchate. Charlemagne confirmed this grant in 774, and in return received the title of *Roman Emperor* from Leo III. in 800. The suspicious charter of Louis-le-Debonnaire, Otho I., and Henry II., the genuineness of which Marino Marini, chamberlain to Pope Leo XII. (Rome, 1822), endeavoured to establish, are the only proofs of these grants of Pepin and Charlemagne to the popes. The temporal power of the popes over the States of the Church, or the dominion of St. Peter, is founded on these documents, of which there only exists a copy, received of the Papal chamberlain Cancio towards the end of the twelfth century. The wise policy of the popes in conferring favours on the Normans in Lower Italy secured to them in these vassals staunch protectors of the holy see. The structure of the Papal power was fully completed in 1075 under Gregory VII. The Crusades contributed more to promote the views of the popes in the commencement than in the sequel. The dominions of Matilda of Tuscany were added to the States of the Church, and the popes maintained possession of them against all the claims of the German emperors. The Papal chair removed a dangerous neighbour belonging to the house of Hohenstaufen by raising the house of Anjou to the throne of Naples in the year 1265. The tyranny of the heads of the church, added to their corrupt life, at last provoked the Romans to opposition, and the popes were obliged to transfer their residence, from 1305 till 1376, to Avignon, which Clement VI. bought of Joanna, queen of Naples and countess of Provence, in 1348. As the choice of the popes made under the influence of the King of France seldom or never obtained the assent of the Romans and Germans, antipopes were elected by the latter, and the welfare of the church as well as of the state suffered by their mutual hostilities. The return of the popes to Rome was favourable to the aggrandizement of their power, although the Norman councils often expressed themselves in bold and independent language. Julius II. added Bologna to the Papal dominions in 1513, and Ancona in 1532. The Venetians were obliged to cede Ravenna. Ferrara was wrested from Modena in 1598, and Urbino was bequeathed to the Papal chair in 1626 by its last duke, Francis Maria, of the house of Rovera. At the same time the popes lost a great part of their temporal and spiritual influence, to the diminution of which the rapid progress of the Reformation from the year 1517 greatly contributed. The wise administration of Sixtus V. restored internal order towards the end of the sixteenth century; but the extravagance and family partialities of his successors created fresh disorder. Clement XIV. was forced to abolish the order of the Jesuits in 1773. Subsequently Naples renounced her feudal obligations to the Papal chair; and even the journey of Pius VI. to Vienna in 1782 could not prevent the great changes which Joseph II. was making in the ecclesiastical affairs of his kingdom. After the successes of the French in Italy the pope was forced at the Peace of Tolentino, Feb. 13, 1797, to cede Avignon to France, and Romagna, Bologna, and Ferrara to the Cisalpine Republic. An insurrection in Rome against the French, Dec. 28, 1797, caused the annexation of the States of the Church to the Roman Republic. Pius VI. died in France. The victories of the Russians and Austrians in Italy favoured the election of Pope Pius VII., March 14, 1800, who, under the protection of Austrian troops, took possession of Rome. By the concordat concluded in 1801 with the First Consul of the French Republic the pope again lost a great part of his temporal power. In 1807 France again declared war, and the provinces of Ancona, Urbino, Macerata, and Camerino were added to the Kingdom of Italy. The possessions of the church beyond the Apennines were all that remained to the pope. Feb. 2, 1808, a French corps of 8000 men entered Rome; the remainder of the Papal States were added to France, and a pension of 2,000,000 of francs settled on the pope, whose ecclesiastical power was to continue. The decree of May 17, 1809, at length put an end to the ecclesiastical state. The pope was detained in France until the events of 1814 again permitted him to take possession of his states. Pius VII. was succeeded by Leo XII., who reigned from 1823 till 1829. He was succeeded by Pius VIII., who, in his turn, was succeeded by Pius IX. in 1846. The first acts of this pope were characterized by such a liberal spirit that men talked in wonder of a reforming pope. The events of 1848 caused the pope to pause in his advanced policy, which so dissatisfied the extreme liberal party that they drove Pius IX. from Rome, and the reins of government fell into the hands of Garibaldi, Mazzini, and Avezzano (1849). Some few months afterwards the French government, resolving to restore the Papal authority, sent General Oudinot with an army against Rome. Defeated in their first attack on the city, the French began a siege in regular form, and in a month's time were masters of it. Pope Pius did not return to Rome, however, until the following year.

After the Austro-Italian war of 1859 the Papal see was stripped of the greatest part of its territorial possessions. Embracing before that date an area of 17,218 square miles, with 3,124,668 inhabitants, the Roman territory was then reduced to 4891 square miles, and 692,106 inhabitants. Of the former legations and delegations into which it was subdivided only five remained, namely—Rome and the Comarca, Viterbo, Civita Vecchia, Velletri, and Frosinone. From 1860 to 1866 the Papal government was sustained by the presence of a French army, which was withdrawn in 1866 upon the King of Italy binding himself by treaty to respect the integrity of the Roman States. In 1867, however, volunteers numbering 15,000, belonging to the Italian party of action, entered the Papal territory, headed by Menotti Garibaldi. They made but little progress until the elder Garibaldi placed himself at their head, when enthusiasts in thousands flocked to join them. Napoleon III., at the earnest prayer of the pope, sent off an army to protect the city against the violence of the volunteers, who had now surrounded it. On the 28th Oct. the French entered Rome, and Garibaldi, beginning to perceive that he would be hemmed in by the regular Italian forces under Cialdini, thought of retreating. Unfortunately an advanced section of the Papal troops came in contact with the Garibaldians (Nov. 3), and were likely to have suffered severely had not two French battalions, armed with the Chassepot rifle, come speedily to their aid. Garibaldi, with 4000 men, retreated into the Italian territory, where they were disarmed. A strong force of French troops were left in occupation of Civita Vecchia after peace was restored, and the pope seemed as secure as ever. But the outbreak of the Franco-German war destroyed the last chance of the temporal power. The French army of occupation left Rome on 30th July, 1870, and the pope was at the mercy of his powerful neighbour Victor Emmanuel, king of Italy, who found himself compelled by the demands of the party of action to lead them on to Rome and make it the capital of the Kingdom of Italy. In September the Italian troops occupied Rome. In October the States of the Church were incorporated with the Kingdom of Italy in virtue of a plebiscite showing 133,681 votes in favour of and only 1507 against this step. In the beginning of July, 1871, Rome became the seat of government and the residence of the court.

CHURCHILL, CHARLES, poet and satirist, was the son of the curate of St. John's, Westminster, in which parish he was born in 1731. He was educated at Westminster School, but made so bad a use of his time that he was refused admission at the University of Oxford from his want of classical knowledge. He accordingly returned to school, but soon closed his education by an imprudent marriage with a young lady in the neighbourhood. He, however, studied in private, and was at length admitted into holy orders by the Bishop of London, and received a Welsh curacy of £30 a year. On the death of his father he obtained his curacy; but owing to the smallness of his income, and most likely to his fondness for theatrical amusements and the company of the wits of the day, he was soon overwhelmed with debt, and had to compound with his creditors. In 1761 he published anonymously a poem called the Rosciad, in which he examined the excellences and defects of the actors in the two houses in London with spirit, judgment, and vivacity. The celebrity of this poem was very great, and the players foolishly increased it by the impatience with which they resented its censures. Pamphlets abounded on both sides of the question; and the author justified himself in a new satire entitled the Apology. These works made him many enemies, for which he cared very little, as they introduced him to the coveted intimacy of the men of wit and pleasure about the town. A course of dissipation and intemperance followed, which excited much animadversion, and elicited from him his next satire, entitled Night. The Cock Lane imposture also formed a topic for his muse, and he hesitated not to satirize Dr. Johnson in the piece entitled the Ghost. He next fell in with the national ill humour against the Scots, which originated in the political occurrences of the commencement of the reign of George III., by his Prophecy of Famine—a strongly-drawn caricature of Scottish disadvantages. This poem was received with great avidity, and he immediately took that rank as a political satirist which he long maintained, to the deterioration of both his poetical and moral character. Of the latter, indeed, he now became utterly careless, and, dropping the clerical habit, he parted from his wife, and immediately began to lead a life of shameless profligacy. Being now a party writer by profession, he cultivated an acquaintance with Wilkes, and employed his pen assiduously in the cause of opposition and for his own emolument. Besides the works already mentioned, he published, within three or four years, an Epistle to Hogarth, the Conference, the Duellist, the Author, Gotham, the Candidate, the Times, Independence, and the Journey. Most of these pieces contain detached pictures, which display a vigorous fancy and forcible sentiments, expressed with great occasional energy. In versification Churchill avowedly imitated Dryden. In Oct. 1764 he went to France to visit Wilkes, and was seized with fever at Boulogne. There he died Nov. 4, and was buried at Dover.

CHURCH OF ENGLAND. See England (Church of).

CHURCH OF SCOTLAND. See Scotland—Ecclesiastical History.

CHURCH-RATE, for the purpose of repairing and sustaining the church, churchyard, and for similar objects, was made by the churchwardens with consent of the parishioners, who fixed the amount, but could not refuse it altogether, as in that event the churchwardens were empowered to levy a rate for necessary purposes. The rate, though applicable for repairs to parish churches only, was exigible from parishioners of all religious denominations, and often gave rise to heart-burnings, which led to repeated proposals for its commutation or entire abolition, which was effected in 1868.

CHURCHWARDENS, officers, generally two for each parish in England, who keep the church and churchyard in order. They are annually chosen by the minister and parishioners, according to the custom of each parish.

CHURN, a vessel in which cream is agitated to separate its buttery globules in a solid mass from the fluid portions. The length of time usually occupied by this process, and the fatigue consequent upon working those machines by hand, have caused the ingenious to produce numerous modifications in form and size: some may be worked by dogs in the way a squirrel-wheel is driven; others may be worked by horse-power, and in some cases steam is the motive power. The ordinary plunge-churn, with its cylindrical box, its straight rod projecting downwards through the cover and attached below to the dasher, has been greatly improved by an arrangement by which the air is introduced into the cylinder at every stroke by a tube run right along the handle, with a valve at its end which opens as the dasher rises, and closes as it sinks. The air is thus dashed through the cream, separating it into innumerable small particles, and throwing it into a state of foam. A box form of churn, with dashers attached to a rod passing horizontally through the box, and driven by a winch, is frequently used. Less common kinds are those in which the whole body of the machine is set in motion, such as the rocking-churn and the barrel-churn. A churn on the centrifugal principle has been introduced into Sweden. Though the rapid completion of the process of butter-making is the principal end in view, it is a well-known fact that butter suffers seriously by too rapid a process. When butter forms in about forty-five minutes it is sure to be good; when it appears sooner it is soft; when later, strong-tasted. See Butter and Dairy.

CHUSAN, an island on the east coast of China, the largest in the archipelago of same name, about 21 miles long, and from 6 to 11 broad. Pop. about 200,000. Its surface is finely diversified by hill and dale. The rocks are evidently volcanic; and the soil, often very fertile, is under good cultivation, for the most part by spade husbandry. On the same slope may be seen, in different stages of their growth, wheat, tea, sweet-potatoes, cotton, and tobacco. There are several towns on the island; the capital is Ting-hae, a walled town of about 2 miles in circumference. From its situation near the mouths of the Yang-tse-kiang, which forms the great channel of communication with the heart of the empire, Chusan is considered as the key of Southern China, and was accordingly taken possession of by the British on two occasions during the first Chinese war. Notwithstanding the great mortality among the British troops during their occupation of the island, the climate is still considered healthy.

CHUTNEY, or Chutny, a condiment compounded of sweets and acids, much used in the East Indies, and thence introduced into England. Ripe fruit, raisins, spices, herbs, chilies or cayenne, lemon-juice, vinegar, &c., are the ordinary components, which are pounded, well boiled together, and then bottled for use. It is much eaten in India with curries, stews, &c.

CHYLE. See Chyme.

CHYME, in animal economy. In the process of digestion the food is subjected to a temperature usually above 90° of Fahrenheit. It is mixed with the gastric juice, a liquor secreted by the glands of the stomach, and is made to undergo a moderate and alternate pressure by the contraction of the stomach itself. It is thus converted into a soft uniform mass of a grayish colour, in which the previous texture or nature of the aliment can be no longer distinguished. The *chyme*, as this pulpy mass into which the food in the stomach is resolved is termed, passes by the pylorus into the intestinal canal, where it is mixed with the pancreatic juice and the bile, and is still exposed to the same temperature and alternating pressure. The thinner parts of it are absorbed by the slender tubes termed the *lacteals*. The liquor thus absorbed, which is called *chyle*, is of a white colour; it passes through the glands of the mesentery, then enters the thoracic duct, and is conveyed by it into the blood at the junction of the left jugular with the left subclavian vein. Chyle is an opaque milky fluid, mild to the taste. By standing for some time one part of it coagulates, another portion is coagulated by heat. The chyle, after mixing with the lymph conveyed by the absorbent vessels, is received into the blood, which has returned from the extreme vessels before this passes to the heart. All traces of it are very soon lost in the blood, as it mixes perfectly with that fluid. It is probable, however, that its nature is not immediately completely altered. The blood passing from the heart is conveyed to the lungs, where it circulates over a very extensive surface presented to the atmospheric air, with the intervention of a very thin membrane, which does not prevent their mutual action. During this circulation the blood loses a considerable quantity of carbon, part of which, it is probable, is derived from the imperfectly assimilated chyle, as this, originating in part from vegetable matter, must contain carbon in larger proportion than even the blood itself.

CIBBER, Caius Gabriel, a celebrated sculptor, a native of Holstein in Germany, visited England during the protectorate of Cromwell, and met with such encouragement as to induce him to settle there. He was employed to execute the bass-reliefs on the pedestal of the London Monument. The work, however, by which he is principally known are his figures of Raving and Melancholy Madness, formerly erected above the gate of the old Bethlehem Hospital, and now in the new hospital, St. George's Fields. He was the father of Colley Cibber.

CIBBER, Colley, a dramatic writer and actor, was born in London, 1671, served under the Duke of Devonshire in the revolution which placed the Prince of Orange on the throne, and then made his appearance at Drury Lane Theatre in 1689. He was not at first very successful, but at length the talent which he displayed in the character of Fondlewife in Congreve's Old Bachelor brought him into notice. In 1695 appeared his first comedy, Love's Last Shift, which met with great success. In this piece he played the part of Novelty, a fashionable fop. This character is found in most of his pieces, and in the representation of it he was likewise distinguished. His dramatic celebrity is founded chiefly on the Careless Husband, which even obtained the approbation of his declared enemy, Pope. This piece, though without novelty in the characters, and without invention in the plot, is a good picture of the manners and follies of the time. His comedy, the Non-juror, an imitation of Molière's Tartufe, adapted to English manners, appeared in 1717, and was directed against the Jacobites. It was very successful, and procured him a pension from the court, but drew upon him many enemies, whose number he increased by his conduct as director of Drury Lane Theatre, from 1711. His appointment as poet-laureate in 1730 gave full play to the raillery of his enemies. Cibber had the good sense to join in the laugh against his own verses, and thus to disarm them. Pope, however, did not cease to ridicule him on every opportunity. Besides writing original works for the stage, he adapted a great number of others, the acted Richard III. being one of those that have passed through his hands. In 1750 he quitted the theatre, and published the Apology for the Life of Colley Cibber, &c., written with spirit and candour, and containing many entertaining anecdotes and judicious remarks. He died in 1757.

CIBBER, Theophilus, son of Colley Cibber, was born in 1703, and embraced the profession of an actor. With respect to personal appearance, nature had been less favourable to him than to his father; but his intelligence and vivacity in his performances compensated for his deficiencies, and he would have been successful on the stage if his extravagance had not continually involved him in difficulties. He was engaged, 1757, to play at a Dublin theatre, but was shipwrecked on the passage and drowned. The Biography of English and Irish Poets, which appeared under his name, was from the pen of Robert Shiels, a Scotsman, who purchased for ten guineas the right of prefixing to the work the name of Cibber, then in prison for debt.—Cibber's wife, Susanna Maria, born 1716, was one of the best actresses on the English stage. She was sister of the celebrated Dr. Arne (composer of Rule Britannia), who taught her music, and introduced her in one of his operas at the Haymarket Theatre. She was so much of a favourite with Handel, that he composed pieces expressly adapted to her voice, and used to instruct her in singing them. In 1734 she married Theophilus Cibber, but was soon after separated from him. She subsequently made her appearance in tragedy. Her beauty and her talents gained her universal admiration. She died in 1766. Garrick is said to have exclaimed when informed that she was dead, 'Then tragedy has expired with her.' She is buried in Westminster Abbey.

CIBORIUM, originally a drinking-vessel made from an Egyptian plant. In the Roman Church it is the vessel in which the consecrated host is preserved, being thus the same as pyx.

CICADA, the name of several species of insects of the order Hemiptera, group Homoptera. They are stout-bodied insects, with a broad short head, four leathery transparent wings extending far beyond the body, very short three to six jointed antennæ, and large prominent ocelli or simple eyes. They are found in the warmer regions of the earth living upon trees, in the bark of which the female lays her eggs, being provided with a boring instrument for the purpose. The cicada has been celebrated from remote antiquity on account of its so-called song, a loud and grating chirp produced by the male by means of a special apparatus on the abdomen. The instruments by which the song is produced are situated on each side of the base of the abdomen, and are covered by two squamose plates. Below there is a cavity divided into two cells by a triangular partition. Examined from its internal side each cell presents anteriorly a white and plaited membrane, and below this a tense, thin, transparent lamina, termed by Réaumur the *mirror*. Viewed from the external side there will be seen another plaited membrane on each side, which is acted on by a powerful muscle; this membrane is the *drum*. The muscles in rapidly contracting and relaxing act on this drum, and so produce the noise. In some South American species this note is said to be loud enough to be heard at the distance of a mile. The ancient Greeks were great admirers of the cicada (in Greek, *tettix*) and its song. It is mentioned by Homer in the Iliad, is celebrated by Plato, and has one of the Anacreontic odes devoted to its praises. The Athenians believed that, like themselves, it was sprung from the soil, and wore golden cicadas in their hair by way of ornament. The celebrated species is the ash cicada (*C. orni*), which inhabits the whole south of Europe, Switzerland, and South Germany. The seventeen years' locust (*C. septendecim*), so called from the belief that it makes its appearance in particular localities at intervals of seventeen years, is common in the United States. (Pl. III., at Entomology.)

CICERO, Marcus Tullius. This celebrated Roman was born in the year of Rome 647 (106 B.C.)

at Arpinum. His family belonged to the order of *equites*, but had always kept themselves aloof from public business and office. His father, who lived in retirement devoted to literary pursuits, was the friend of the first citizens of the republic. Amongst this number was the celebrated orator Crassus, who himself attended to the education of the young Cicero and his brother Quintus, selected teachers for them, and directed their studies. The perusal of the Greek authors, together with poetry, oratory, and philosophy, occupied the first years of Cicero's youth. He wrote a great deal in Greek. His versification was good, but his poetical merits, on the whole, only moderate. His destination was to be first orator of Rome. In his youth he made one campaign under Sulla, in the Marsic war. After his return he availed himself of the instruction of the academician Philo, and of the celebrated orator Molo, and employed several years in acquiring the knowledge requisite for an orator. He witnessed the barbarities of Marius and Cinna, and the proscriptions of Sulla, after which the exhausted, blood-stained republic remained undisturbed under the yoke of its dictator. Cicero, at that time twenty-six years old, endowed with knowledge and genius, appeared before the tribunals, at first in civil suits, afterwards in a criminal process, in which he defended Sex. Roscius of Ameria, who was accused of parricide by Chrysogonus, a freedman of Sulla. He conducted this defence with courage, confuted the accusers, and obliged the judges to acquit the accused. After this brilliant display he remained a year in Rome, and undertook another suit. His conduct, in both instances, must have displeased the dictator. But his debilitated health obliged him to travel; and he went to Athens, which was still the centre of science (B.C. 79). Here he resided in the house of an academician, was visited by the philosophers of all the schools, and profited by the instruction of the masters of oratory. Thus he passed six months with his friend Atticus, in the enjoyment of literary pursuits. He also undertook a journey to Asia, and remained some time at Rhodes, where he likewise visited the most distinguished orators, and took part in their exercises. On his return to Rome his displays of eloquence proved the value of his Grecian instruction, and his rivals Hortensius and L. Aurelius Cotta were forced to yield to him the palm of oratory. At last, at the age of thirty, he engaged in public business. He became quæstor of Sicily during the prevalence of a great scarcity at Rome, and managed to convey a large quantity of corn from thence to the capital, though it was difficult for him so to do without exciting the displeasure of the Sicilians. He afterwards returned to Rome and appeared as an orator, defending the causes of private individuals merely for the sake of fame. It was an honourable day for Cicero when the ambassadors from Sicily appeared before him with the request that he would conduct their suit against their governor, Verres. He showed himself worthy of the confidence of an oppressed people, and appeared against this powerful robber after having himself collected proofs of his crimes in Sicily. He was opposed by the celebrated Hortensius. The crimes of Verres are painted in the liveliest colours in his immortal speeches. Seven are preserved, but only two of them were delivered. Hortensius was struck dumb by the force of truth, and Verres went into voluntary exile. After this suit Cicero was elected to the office of ædile (B.C. 70). Though possessed of only a moderate fortune, he managed by well-timed liberality to gain the affections of the people whilst he held this office, and at the close of B.C. 67 he was elected first prætor. But in order to obtain the consulship on which he had now fixed his eyes, it was necessary to obtain the friendship of the great. With this view he joined the party of Pompey, the head of the nobility and the first citizens of Rome. He became his panegyrist and most zealous adherent.

Catiline at that time began to plan his conspiracy against the republic. He was accused of extortion in his government of Africa, and Cicero was on the point of undertaking his defence when they became rivals, being both candidates for the consulship. Cicero's merit prevailed over Catiline's intrigues and the envy of his enemies. He was chosen consul unanimously, and entered on his office in B.C. 63, and then began the most splendid period of his political life. He succeeded in defeating the conspiracy of Catiline (see CATILINE), after whose fall he received greater honours than had ever before been bestowed upon a Roman citizen. He was hailed as the saviour of the state, and the father of his country (*parens patriæ*), and thanksgivings in his name were voted to the gods. But Cicero's fortune had now reached the culminating point, and soon was to decline. The Catilinarian conspirators who had been executed had not been sentenced according to law, and Cicero as chief magistrate was responsible for the irregularity. When at the close of his consulship he stood up, according to custom, to render an account of his administration, he was stopped by the tribune Metellus Celer, on the ground that, having put Roman citizens to death without a hearing, he himself was unworthy of being heard. Accordingly he was only able to pronounce the celebrated oath, 'I swear that I have saved the republic.' Cæsar was always his opponent, and Pompey feared a citizen who loved liberty too much to be favourable to the triumvirs. Cicero saw his credit gradually decreasing, and even his safety threatened. He therefore occupied himself more than ever with science, wrote the history of his consulate in Greek, and composed a Latin poem on the same subject, in three books. At last the storm broke out. Clodius, Cicero's enemy, caused a law to be renewed declaring every one guilty of treason who commanded the execution of a Roman citizen before he had been heard in his own defence. The illustrious ex-consul put on mourning, and appeared, accompanied by the *equites* and many young patricians, demanding the protection of the people. Clodius, at the head of armed adherents, insulted them repeatedly, and ventured even to besiege the senate. Cicero upon this went into voluntary exile, leaving Rome in B.C. 58, and ultimately took refuge in Thessalonica, with Plancus. Clodius in the mean time procured new decrees, in consequence of which Cicero's country-seats were torn down, and a temple of freedom built on the site of his house at Rome. His wife and children were exposed to ill treatment.

Whilst the accounts of these occurrences drove the unhappy man almost to despair, a change favourable to him was preparing in Rome. The audacity of Clodius became equally insupportable to all. Pompey encouraged Cicero's friends to get him recalled to Rome. The senate declared that it would not attend to any business until the decree which ordered his banishment was revoked. Through the zeal of the consul Lentulus, and at the proposition of several tribunes, the decree of recall passed the assembly of the people, in the following year, in spite of a bloody tumult, in which Cicero's brother Quintus was dangerously wounded. Cicero returned after an absence of ten months. The assembled senate received him at the gates of the city, and his entry resembled a triumph. But all power at Rome was now in the hands of the triumvirs Crassus, Pompey, and Cæsar, and for the next few years Cicero had to be more of an onlooker than an actor, and even submitted to praise and flatter what he disliked and despised. To oblige Pompey he defended Vatinius and Gabinius, two citizens of bad character, who had shown themselves his implacable enemies. At the age of fifty-four he entered the college of the augurs. The death of the turbulent Clodius, who was slain by Milo, delivered him from his most dangerous opponent. He defended the perpetrator of this act, who was his friend and avenger, in a beautiful speech; but the presence of Pompey's soldiers, and the tumult of the friends of Clodius, confused him whilst delivering it. At this period the senate appointed him governor of Cilicia (B.C. 52). Cicero conducted a war while in this office with good success, repulsed the Parthians, and was greeted by the soldiers with the title of *imperator*. As soon as his term of office had expired he returned to Rome (Jan. B.C. 49), which was threatened with serious disturbances owing to the rupture between Cæsar and Pompey. Dreading the horrors of a civil war, he endeavoured in vain to reconcile the rivals. Cæsar advanced towards Rome, and Pompey was forced to flee with the consuls and the senate. Cicero, not anticipating this sudden approach of Cæsar, was still in Italy. Cæsar saw him at Formiæ, but was not able to gain him over; for although convinced that the party of Cæsar was likely to prevail, and although his son-in-law, Dolabella, was one of Cæsar's confidants, he was prompted by his sense of honour to return to Pompey. After the battle of Pharsalia and the flight of Pompey he refused to take the command of some troops who had remained at Dyrrhachium, but returned to Italy, which was governed by Cæsar's representative, Antony. This return was attended with several unpleasant circumstances, until the conqueror wrote to him, and soon after received him graciously (B.C. 47).

Cicero now devoted himself entirely to literature and philosophy. He was divorced from his wife Terentia, to enable him to marry Publilia, a beautiful and rich heiress, whose guardian he was; but this union was not happy, and was speedily dissolved. In B.C. 45 the death of his daughter Tullia occurred, and affected him very painfully, as he had been devotedly attached to her. The assassination of Cæsar opened a new career to the orator. He hoped to regain great political influence. The conspirators shared with him the honour of an enterprise in which no part had been assigned him; and the less he had contributed to it himself, the more anxious was he to justify the deed, and pursue the advantages which it offered. But Antony took Cæsar's place. Even in this turbulent year Cicero found leisure for literary occupations, and, among other labours, completed his work De Gloria, which was lost as late as the fourteenth century. He determined on going to Greece, where he could live in safety; but he soon returned to Rome, and composed those admirable orations against Antony, delivered in B.C. 43, which are known to us by the name of *Philippics*, and which are equally distinguished for eloquence and patriotism. His implacable enmity towards Antony induced him to favour young Octavianus, who professed to entertain the most friendly feelings towards him. With him originated all the energetic resolutions of the senate in favour of the war, which the consuls and the young Cæsar were conducting, in the name of the republic, against Antony. Octavianus having possessed himself of the consulate, and formed an alliance with Antony and Lepidus, after the death of the two consuls, the power of the senate and of the orator yielded to the arms of the triumvirs. Cicero was at last convinced that liberty was at an end. At Tusculum, whither he had retired with his brother and nephew, he learned that his name, at Antony's demand, had been added to the list of the proscribed. He repaired in a state of indecision to the sea coast, and embarked. Contrary winds drove him back to the shore. At the request of his slaves he embarked a second time, but soon returned again to await his fate at his country-seat near Formiæ. 'I will die,' exclaimed he, 'in my country, which I have more than once saved.' His slaves, seeing the neighbourhood already disturbed by the soldiers of the triumvirs, endeavoured to convey him away in a litter, but soon discovered the murderers at their heels. They prepared for combat; but Cicero, who felt that death was unavoidable, ordered them to make no resistance, bent his head before Popilius, the commander of the murderers, who had once been saved by his eloquence, and suffered death more courageously than he had borne misfortune. He died in his sixty-fourth year, A.U.C. 711 (B.C. 43). His head and hands were, by the orders of Antony, affixed to the same rostrum from which the orator, as Livy says, had poured forth eloquence unequalled by any human voice.

Cicero's eloquence has always remained a model. After the revival of learning he was the most admired of the ancient writers; and the purity and elegance of his style will always place him in the first rank of Roman classics. The style of his philosophical writings, without oratorical ostentation, breathes the pure Attic elegance which some of his contemporaries wished also to see in his orations. The orator is seen, however, in his prolix and comparatively unanimated dialogues. His philosophical works, the principal part of the contents of which is taken from the Greek, and which combine academic and stoic doctrines and principles, possess very unequal interest for us. Thus, for example, his work De Natura Deorum is for us only a collection of errors: the Tusculanæ Quæstiones are full of the subtleties of the Athenian school: his work De Finibus Bonorum et Malorum likewise belongs to this somewhat dry, dogmatic philosophy. On the other hand, his works on practical morals have maintained their full value. The book De Officiis is to this day the finest treatise on virtue inspired by pure human wisdom. The pleasures of friendship and old age have likewise been excellently set forth in De Amicitia and De Senectute. Of his political work De Republica, a considerable part was brought to light by Mai, and published in Rome in 1822. Cicero wrote the six books De Republica in his fifty-fourth year. In these he endeavoured to show by what policy, what resources, and what morals, Rome had obtained the dominion of the world. Cicero's works De Divinatione and De Legibus are instructive monuments of antiquity. The same philosophical spirit is evident in all his oratorical treatises, particularly in the most important of them, De Oratore, although this contains as little of utility for us as the Claris Oratoribus, Topicis, De Partitione Oratoria, &c. The most interesting of all Cicero's works for posterity are his Epistolæ familiares and Ad Atticum, which give a more exact and lively idea of the state of the republic than any of his other works, and display most strongly the characteristic traits of the author. The life of Cicero was written of old by Plutarch, and has been also in modern times by Middleton and Forsyth.

CICERONE, the title of the person who, in Italy, and particularly in Rome, shows and explains to strangers curiosities and antiquities. The talkativeness of such persons has procured them the name *cicerone*, in jocular allusion to Cicero. This term is falling into disuse, the official designation, *servitore di piazza*, or simply *guida* (guide), being used instead.

CICISBEO, a name given since the seventeenth century in Italy to the professed gallant of a married lady. It was the fashion among the higher ranks in Italy for the husband, from the day of marriage, to associate with his wife in his own house only. In society or places of public amusement she was accompanied by the *cicisbeo*, who even attended at her toilet, to receive her commands for the day. This custom is the more extraordinary, from the natural jealousy of the Italian, who seemed to change his character completely after marriage.

CICUTA, a poisonous genus of umbelliferous plants of which *Cicuta virosa*, the water hemlock or cowbane, is a native of Britain, growing in ditches and on the margins of rivers, &c. Its stem is 3 or 4 feet high, hollow, and branched, with biternate leaves, the radical ones pinnate. The plant is a dangerous poison, said to be fatal to cattle that eat it. Persons are known to have died from eating the root, which is white and fleshy. An American species, *C. maculata*, is equally dangerous. The genus has no general involucre to the compound umbels, and the partial involucres consist of several awl-like bracts. The common or true hemlock is *Conium maculatum*. It also is a poisonous umbellifer, with a stem from 2 to 4 feet in height, hollow, striated, and spotted with purple; leaves large, much divided, and fetid when bruised; and with unilateral partial involucres—marks by which the common hemlock is readily distinguished from the water hemlock, and from any other species of the Umbelliferæ. It is indigenous in most temperate climates, and is extensively used in medicine, being given internally as a sedative, and applied externally to sores, ulcers, &c., in the form of a poultice or ointment. The Latin *cicuta* was the true hemlock. See HEMLOCK.

CICONIA, the genus of birds to which the common stork belongs, and which is the type genus of the family Ciconiidæ.

CID. Don Rodrigo (Ruy) Diaz, count of Bivar, born in 1026, the model of the heroic virtues of his age, and the flower of Spanish chivalry, styled by his enemies, the Moors of Spain, *el seid* or *cid* (the lord), and by his king and countrymen *Campeador* (champion), continues to live in the poetry of his country. Rodrigo loved and was beloved by Ximena, daughter of Lozano, count of Gormaz, who, with Diego, the father of Rodrigo, excelled all the knights at the court of Ferdinand I. of Castile. The envy of Gormaz at Diego's superior estimation at court produced a dispute between the two which led to a duel. Gormaz vanquished the old Diego, and insult being added to this disgrace Diego demanded from his son the blood of the offender. In the contest between honour and love the former prevailed in the breast of the youth, and Gormaz fell. Ximena, unfortunate as a daughter and a mistress, could no longer listen to the voice of love: it became necessary for her to demand vengeance on the object of her affections. But no champion was found to meet the young hero; and nothing but the discharge of the important duties which devolved upon him could preserve him from sinking under his despair. Five Moorish kings appeared in Castile: devastation and death accompanied their progress. Rodrigo, who was not yet twenty years of age, threw himself upon his noble horse Babieca, and at the head of his vassals went to meet the enemy, who soon ceased to be the terror of the country. The young hero sent the five captive kings to Ferdinand, who, as a reward for his bravery, gave him Ximena, and united those whom the decrees of fate seemed to have separated for ever. They were married in Valencia. Ferdinand afterwards added Galicia, Leon, and Oviedo to Castile, and posterity calls him the *Great;* but it was Rodrigo who gained him the name. A quarrel having arisen between Ferdinand and King Ramiro of Arragon concerning the possession of Calahorra, the latter challenged him to single combat, and appointed for his substitute the knight Martin Gonzalez. Ferdinand chose the Cid for his champion, and by his means obtained Calahorra. Ferdinand in his will divided his dominions among his sons: to Sancho he gave Castile, to Alfonso he gave Leon and Oviedo, and to Garcia, Galicia, together with the conquered part of Portugal. This division caused a war between the brothers, in which Sancho was victorious: this success was owing to the Cid, to whom he had given the command of his forces. Alfonso was taken prisoner, Garcia brought ruin upon himself by his own imprudence, and it remained only to overcome the obstinate resistance of Zamora, where Sancho's sister Urraca ruled. Before the walls of this city Sancho was assassinated, and Alfonso was called to the throne. It is related in the ballads that the Cid, appointed by the states of Castile to read the oath of purification before the new king, on account of the murder of Sancho, read with such impressive solemnity that Alfonso shuddered, but was also offended. It is certain that he spared nothing to gain over the Cid.

The story of this warrior requires a critical examination, especially what relates to his marriage. According to history Alfonso married him to Donna Ximena, his niece (in 1074), and consequently it seems we must consider him twice married. John von Müller, the German historian, supposes that the daughter of the proud Gormaz may have been his first Ximena. However that may be, it is certain that the Cid, notwithstanding the important services which he rendered to his king, often experienced the inconstancy of royal favour. A man like him, of strict integrity and virtue of an inflexible and lofty spirit, who despised an effeminate life, was not fitted for courts. His true friend and brother in arms, Alvaro Hanez Minaya, his wife and child, were his world. The gravity of his countenance excited respect and reverence; his retired life afforded room for the slanders of the courtiers; and he was exposed to frequent reproaches. But in times of necessity his assistance was again sought, and he was too generous to remember past offences. The king finally took from him all that he had given him, wife and treasures; but from shame or fear he afterwards restored Ximena. Disgraced, plundered, forced to depend on himself alone, Rodrigo was now happier and greater than before. Ever true to his country and his religion, he raised an army by the reputation of his name alone to subdue the Moors in Valencia. In the midst of his career of conquest he hastened to the assistance of his king, who was hard pressed by Joseph, the founder of Marocco; but the only return for his generosity was new ingratitude. He therefore departed by night with his most trusty followers, and, forsaken and ill-provided, fled from the king. He, however, remained true to himself, and fortune to him. His magnanimity again overcame the king. Permission was given to all to join the forces of the Cid, who still maintained the cause of Spain, and always with distinguished success. Alfonso declared aloud, in the presence of the envious courtiers, 'This Cid serves me much better than you,' and could no longer be prevented from visiting him. From this time he was never estranged from him, although he unintentionally promoted the machinations of his enemies. Two brothers, counts of Carrion, had resolved, by a marriage with the daughters of the Cid, to obtain possession of his wealth. The king himself promoted their suit, and the Cid yielded to his wishes. With Donna Elvira and Donna Sol they received likewise the great treasures which the arms of the Cid had won. But scarcely had they dismissed their attendants, when, in a wild, mountainous desert, they stripped the garments from the persons of the ladies, beat them till pain choked their cries, tied them to two trees, and departed with the money. A trusty servant whom the Cid had sent after them delivered the ladies from their wretched situation, and the vile deed was brought to light. The Cid demanded justice. Alfonso summoned all the vassals of Leon and Castile to a high court of justice at the city of Toledo. The Cid demanded the restoration of his treasures, and opportunity to take vengeance for the insult, by a combat between the counts of Carrion and the champions whom he should name. They sought to avoid the combat, but the king insisted on it. With ill-concealed fear they rode to the lists; the knights of the Cid overcame both them and their uncle; their dishonoured lives were spared. The last exploit of the Cid was the capture of Saguntum (Murviedro), after which he died at Valencia, in the seventy-fourth year of his age (1099). What this hero won, and for many years defended, the united power of Leon and Castile was scarcely able to preserve against the encroachments of the infidels. His dead body was mailed and mounted upon his favourite steed and marched out against the enemy, who fled at its approach. He was buried at the convent of San Pedro de Cardeña, in Castile, in a tomb which was honoured by emperors and kings. There rests the noble Ximena, and under the trees before the convent lies the faithful horse Babieca.

The adventures of the Cid, particularly his banishment and return, are the subjects of the oldest Castilian poem, probably composed at the end of the twelfth century, Poema del Cid el Campeador, which was first published in the Coleccion de Poesias Castellanas anteriores al Siglo XV., of Sanchez, in 1775; but the best edition of which is that of Hinard, Paris, 1858. The later ballads which commemorate the hero, were at the beginning of the sixteenth century collected by Fernando del Castillo, and in 1614 again published by Pedro de Florez in the Romancero General. There has also been published a collection by Escobar—Historia del muy noble y valeroso Caballero el Cid Ruy Diaz, en Romances (Lisbon, 1615; Seville, 1632). Whatever chronicles and songs have conveyed to us of the history of the Cid, is collected in the Chronicle of the Cid, from the Spanish, by Robert Southey (London, 1808, 4to).

CIDER, a liquor made from the juice of apples. The quality of this popular beverage depends principally on the following particulars, viz.: 1, kind of fruit; 2, condition of the fruit when ground; 3, manner of grinding and pressing; 4, method of conducting the requisite fermentation, and precautions to be taken against its excess.

1. The characteristics of a good cider apple are a red skin, yellow and often tough and fibrous pulp, astringency, dryness, and ripeness at the cider-making season. When the rind and pulp are green, the cider will always be thin, weak, and colourless; and when these are deeply tinged with yellow, it will, however manufactured, or in whatever soil the fruit may have grown, almost always possess colour and either strength or richness. The most certain indications of the ripeness of apples are the fragrance of their smell and their spontaneously dropping from the trees. When they are in this state of maturity on a dry day (all the better if the weather is cool and bracing), the limbs may be slightly shaken and partly disburdened of their golden store; thus taking such apples only as are ripe, and leaving the unripe longer on the trees, that they may also acquire a due degree of maturity. They must be carefully gathered to avoid bruising, as mouldiness rapidly fixes upon the edges of every wound of a fruit gathered in autumn, and communicates a disgusting flavour to the juice. The only artificial criterion employed to ascertain the quality of an apple for cider is the specific gravity of its *must*, or unfermented juice; or the weight compared with that of water. This indicates with very considerable accuracy the strength of the future cider. Its weight and consequent value are supposed to be increased in the ratio of the increase of saccharine matter. The strongest and most highly-flavoured cider which has been obtained from the apple was produced from fruit growing on a shallow loam, on a limestone basis. All the writers on the subject seem to agree that calcareous earth should form a component part of the soil of a cider-orchard. The best authorities prefer a dry and somewhat loose soil, in which the roots may penetrate freely, and range extensively in search of nutriment.

2. *Condition of the Fruit.*—Fruit should be used when it has attained full maturity, and before it begins to decay. Each kind of apple should be manufactured separately, or at least those kinds only should be mixed which ripen about the same time. The longer the fruit remains on the tree without decay or being injured by frost the better, for not only is the perfect maturity of the juice an important consideration, but such is the susceptibility of this juice, that the colder the weather, short of actual frost, the more quiet and equable will be the fermentation. When gathered the apples must be carefully stored in some shady cool room, placed in heaps, where they undergo a further ripening, acquiring more saccharine matter and losing a considerable quantity of watery juice.

3. *Grinding, &c.*—This operation should be deferred till December, if possible; at whatever period it takes place it is absolutely essential that the weather should be cold, even slightly frosty, to counteract the tendency to rapid fermentation. The apples should be reduced by the mill as nearly as possible to a uniform mass, in which the rind and seeds are scarcely discoverable, and the pomace should be exposed to the air. It has been ascertained that, by exposing the reduced pulp to the operation of the atmosphere for a few hours, the specific gravity of the juice increases from 1·064 to 1·078. For fine cider the fruit should be ground and pressed imperfectly, and the pulp then exposed twenty-four hours to the air, being spread and once or twice turned, to facilitate the absorption of oxygen; it should be then ground again, and the expressed juice added to it before it is again pressed. The ordinary mill used by farmers in the cider districts consists of a heavy cylindrical stone 3 or 4 feet in diameter and about 1 foot thick, which is made to revolve and rub along in a circular trough in which the apples are placed. But a more perfect method is to employ cylindrical rollers placed so near each other as to crush the pips. They are fed from a hopper above them, from which the apples pass between a pair of fluted or toothed cylinders, by which they are torn and partially crushed before reaching the more perfectly crushing apparatus below. The mass is then put into haircloths and powerfully pressed, and the liquor is run into casks.

4. *Fermentation.*—The vinous fermentation commences and terminates at different periods, according to the condition and quality of the fruit and the state of the weather. The best criterion to judge of the proper moment to rack off (or draw the liquor from the scum and sediment) will be the brightness of the liquor which takes place after the discharge of fixed air has ceased and a thick crust is collected on the surface. The clear liquor should then be drawn off into another cask. If it remains bright and quiet, nothing more need be done to it till the succeeding spring; but if a scum collects on the surface it must

immediately be racked off again, as this would produce bad effects if suffered to sink.

Among the precautions used to prevent excessive fermentation is *stumming*, which is fuming the cask with burning sulphur. This is done by burning a rag impregnated with sulphur in the cask in which the liquor is to be decanted, after it has been partly filled, and rolling it so as to incorporate the liquor with the gas. A bottle of French brandy or half a gallon of cider-brandy, for each barrel of cider, is likewise recommended to be added as soon as the vinous fermentation is completed.

CIENFUEGOS, Nicasio Alvarez de, a modern Spanish poet, born at Madrid in 1764, studied at Salamanca at the time when the modern school of Spanish poetry was founded there by Cadalso and Melendez. He attached himself to this school, and in 1798 laid the foundation of his literary fame by the publication of a collection of poems. Shortly after he became editor of the government newspapers La Gaceta and El Mercurio, and was at last appointed to the department of foreign affairs. He was in possession of this office when the war of Independence broke out. Madrid was occupied by the French, and Cienfuegos, having both offended Murat by an article in La Gaceta and taken part in the insurrection of May, 1808, was brought to trial and condemned to death. At the intercession of some influential friends the sentence was commuted to banishment to France, where he died in 1809. His tragedy of Pitaco had procured his admission to the Spanish Academy. He also wrote the tragedy of Idomeneo, and the comedy of the Magnanimous Sisters. His tragedies are considered his best works.

CIENFUEGOS, a seaport on the south coast of the island of Cuba, with a safe and capacious harbour, 130 miles south-east of Havana, with which (and other towns) it is connected by railway. It is among the finest towns of the island, and exports sugar, wax, timber, &c., to the value of over £1,000,000 annually. Pop. (1899), 30,038.

CIEZA, a town, Spain, in the province and 24 miles N.W. of Murcia, on an eminence near the right bank of the Segura, with 10,371 inhabitants. It has spacious and tolerably well-built streets, a large church and ancient tower, manufactures of linen and hempen fabrics, and a trade in corn, wine, oil, and silk.

CIGAR. See Tobacco.

CIGNANI, Carlo, a celebrated painter, born at Bologna in 1628; he was a pupil of Albano. He frequently commenced new works, but was seldom sufficiently satisfied with his productions to consider them as finished. His Flight to Egypt was the work of six months. He knew how to compose, like the Caracci, and to distribute his figures in such a way that his paintings appear larger than they really are. His finest fresco paintings are at St. Michael in Bosco, at Bologna, in ovals supported by angels, and in the saloon of the Farnese Palace, where he represented Francis I. of France touching for the king's-evil. At Parma, in the ducal garden, he painted several pieces expressive of the power of love, which will bear comparison with the paintings of Augustino Caracci. In his painting of the Assumption, at Forli, he has imitated the beautiful Michael of Guido in the cupola at Ravenna, and other fine conceptions of this painter; but in his other pieces he made Correggio his model. He does not so often introduce foreshortenings as the Lombards; and in his outlines and drapery he possesses a finish peculiar to himself. His pencil is powerful, and his colouring lively. Clement XI. conferred on him several marks of distinction. Being commissioned to paint the cupola of the church of Madonna del Fuoco, at Forli, he repaired to Forli with his numerous pupils, where he died in 1719. His paintings have been engraved by various artists. Of his pupils the most distinguished were Crespi, Franceschini, Quaini, Count Felix Cignani, his son, and Count Paul Cignani, his nephew.

CIGOLI, Ludovico Cardi da. See Cardi.

CILICIA, in ancient geography, the region between Pamphylia and Syria, lying s. of Mount Taurus. The inhabitants of the coasts were formidable as pirates, and even disturbed the Ægæan and Ionian seas. The inhabitants of the northern portion lived in part a nomadic life; those in the east were devoted to agriculture. Alexander made Cilicia a Macedonian province; it then passed to the Syrians. Pompey subdued its piratical inhabitants. The mountainous parts were left in the hands of the native princes; the rest, in 66–67 B.C., was constituted a Roman province, of which Cicero was pro-consul in 51–50 B.C.

CIMABUE, Giovanni, one of the restorers of the art of painting in the middle ages, born at Florence in 1240, renounced his studies to follow his inclination for painting. Two Greek artists, who were invited to Florence by the senate to paint a chapel in the church of Santa Maria Novella, were his first masters. Although these artists handled the pencil awkwardly, they however taught him, according to ancient tradition, the proportions which the Greek artists had observed in their imitations of the human figure. Attentive to their instructions, Cimabue studied principally the fine antique statues. He was the first to point out to succeeding painters the elements of the *beau ideal*, the memory of which had been extinguished during several centuries of disorder. It is true the paintings of Cimabue do not exhibit that harmonious distribution of light and shade which forms the *chiaroscuro*. His colouring is dry, flat, and cold; the outlines of his figures intersect each other on a blue, green, or yellow ground, according to the effect which he had in view. He had no idea of linear and aerial perspective. His paintings are, properly speaking, only monochromes. But these faults, which are to be attributed to the infancy of the art, are compensated for by beauties of a high order—a grand style, accurate drawing, natural expression, noble grouping, and a fine disposition of his drapery. His best paintings are in the church of Santa Maria Novello at Florence, and in the Sacro Convento at Assisi. He is said to have died about 1302. He may be considered the link between the ancient and modern schools of painting. Cimabue evinced a generous appreciation of Giotto, whom tradition says he discovered drawing figures on the smooth surface of a rock while tending his sheep, and whom he took with him to Florence, and instructed with such success that the pupil soon excelled his master. See Painting.

CIMAROSA, Domenico, a composer, born at Naples in 1749, -54, or -55, received his first musical instruction from Sacchini, entered the conservatory of Loretto, where he imbibed the principles of the school of Durante, and studied with great assiduity. He soon displayed his superiority in the Sacrificio di Abramo, the Olimpiade, and other compositions. At the age of twenty-five he had already gained the applause of the principal theatres of Italy. He was invited to St. Petersburg (where he remained four years) and to several German courts to compose heroic and comic operas. In the latter he particularly distinguished himself by the novelty, warmth, humour, and liveliness of his ideas, and by a thorough acquaintance with stage effect. Among his 120 operas the most celebrated are Penelope, Gli Orazj e Curiazj, and Artaserse, among the *opere serie;* and among the *opere buffe*, L'Italiano in Londra, L'Amor Costante, Il Pittore Carigino, and many others. His comic opera, Il Matrimonio Segreto, excited general enthusiasm, and received the signal honour of being performed twice on the same evening, at the desire of the Emperor Leopold. From Vienna he went to Naples, and became involved there in the revolutionary commotions. He died at Venice in 1801 from the effects of the ill treatment which he had been subjected to in prison. His bust, by Canova, was placed in the Pantheon at Rome in 1816 by the side of those of Sacchini and Paesiello.

CIMBRI, a tribe which inhabited Jutland (the Chersonesus Cimbrica), whence they sallied, together with the Teutones, and became among the most formidable of the enemies of Rome. In the year 114 B.C., when the Romans were already masters of a part of the eastern Alps, in the present Carniola, Istria, &c., and had established themselves in Dalmatia and Illyria, along the coast, immense bodies of barbarians suddenly made their appearance, who overcame the consul Papirius Carbo in the country now called Styria; but instead of entering Italy they proceeded to the north, and soon after, jointly with the Tigurians, entered the territory of the Allobroges. The Romans sent two armies, commanded by the consuls L. Cassius and M. Aurelius Scaurus, to oppose them, but both were defeated—the former by the Tigurians, the latter by the Cimbri. Even after this success the victors did not enter Italy, but overran Gaul with three bodies, consisting of Teutones, Cimbri, and Ambrones. Two new armies, with which the consul C. Manlius and the proconsul Q. Servilius Cæpio hastened to oppose them, were likewise defeated beyond the Rhodanus. The Romans lost, according to Aetius, 80,000 men. Whilst Rome placed her last hope in Marius, the barbarians overran the other western countries of Europe. Gaul suffered severely, but the Iberians and Belgians repulsed the invaders. Upon this they resolved to descend into Italy. The Teutones and Ambrones were to enter on the western side of the Alps, the Cimbri and Tigurians on the east. After Marius had waited the approach of the first during three entire years, and had accustomed his troops to their appearance, he routed them completely (102 B.C.) in two days—on the first day the Ambrones, on the second the Teutones—at Aix in Provence. The Cimbri, on the other hand, who had driven back the consul Catullus on the Adige, and had spread themselves along the Po, demanded land of the Romans, but were totally routed by Marius at Vercelli, 101 B.C. About a century after this the Cimbri sent (from the Cimbrian Chersonesus) an embassy to the Roman emperor Augustus, to offer him presents and to ask pardon for what they had previously done against the Romans. The nationality of the Cimbri is a disputed point. Similarity of name led the ancients to identify them with the Cimmerians, but this view is no longer held. Some authorities believe them to have been of Germanic, others of Celtic race. Their name certainly has a great resemblance to that of the Celtic Kymri; and their armour and customs, according to Plutarch and Strabo, were very different from those of the Germans. 'All these circumstances render it in the highest degree probable that the Cimbri were a Celtic or Gallic and not a Germanic nation' (Schmitz, in Smith's Dict. of Greek and Roman Geog.)

CIMEX LECTULARIUS (house or bed bug), a well-known and most annoying insect, of a flat shape and rust colour, furnished with two antennæ, six legs, and a long sharp proboscis. The female deposits from twelve to fourteen eggs, which hatch in from five to twelve days. The young, at first transparent and white, change to red on being filled with blood. The best remedy is to wash infested furniture with a solution of corrosive sublimate or spirits of turpentine.

CIMMERIANS, a tribe half-mythical, half-historical, described first in the Odyssey as dwelling beyond the ocean-stream, in thickest gloom, unvisited by Helios. From Herodotus we learn that they originally inhabited the country between the Borysthenes and the Tanais, but being expelled by the Scythians, they travelled along the shores of the Euxine, passed through Colchis and over the Halys, and entered Asia to the west of that river. Against this it is urged that the route by the Euxine would be impassable for a nomadic people, the Caucasus running down to the very shores of that sea. The sum of our certain knowledge respecting this people is, that they seem to have been the chief occupants of the Tauric Chersonesus (the Crimea), where they had a large city, near which were fortifications inclosing the isthmus by an earthen wall.

CIMOLIAN EARTH, or CIMOLITE, received its name from Kimōlos, one of the Cyclades, in the Ægean Sea, where it is still to be found. It is of a light colour, compact, and somewhat slaty. Water soon splits it up; when ground with water it forms a thick cream. It is a hydrated silicate of aluminium, and appears to be formed by the decomposition of augite. In classical times it was used as a soap for cleaning delicate fabrics, and by the bath-keepers. It is mentioned by Aristophanes in this connection. It is still used in the island as a detergent.

CIMON, son of Miltiades and Hegesipyle, daughter of a Thracian prince, Olorus, was, according to Plutarch, educated in a very negligent manner, and indulged in every species of excess. In the Persian war he began to make himself known. When Themistocles proposed to abandon the city and take refuge in the ships, in order to carry on the war by sea, Cimon, in company with several other young men, ascended the citadel, deposited the bridle of his horse in the temple, and took from the wall one of the shields, with which he went down to the fleet. He displayed great courage in the battle of Salamis, and attracted the attention of Aristides, who considered him fit to counteract the dangerous influence of Themistocles. When the Athenians, in concert with the other Greeks, sent a fleet to Asia for the purpose of delivering their colonies from the Persian yoke, they gave Aristides and Cimon the chief command; and the return of Aristides to Athens soon after left Cimon at the head of the whole naval force of Greece. He distinguished himself by his splendid achievements in Thrace, defeated the Persians on the banks of the Strymon, and made himself master of the country. He conquered the island of Scyros (B.C. 476), the inhabitants of which were addicted to piracy, and founded a colony there. Here he found the remains of Theseus, and transported them to Athens, where a temple was then built for the first time to this hero. He next subdued all the cities on the coast of Asia Minor, and went against the Persian fleet, which lay at the mouth of the Eurymedon. The Persians, although superior in number, did not dare to abide an engagement, but sailed up the river to place themselves under the protection of their land forces. Cimon pursued and attacked them, and took or destroyed more than 200 of their ships. He then landed, and entirely defeated their army. These two victories, achieved in one day (B.C. 469), delivered Greece from the Persians. Cimon returned to Athens, in the embellishment of which he employed the spoils which he had taken. He removed the walls from his fields and gardens that every one might be at liberty to take whatever he pleased. His table was spread for all the citizens of his demos. He never appeared in public without being attended by several slaves bearing garments, which he distributed to the poor. He adorned the city with elegant walks, caused the market-place to be planted with plane-trees, transferred the academy to the beautiful gardens of Athens, all at his own expense. This generosity was the more noble, as it could hardly be attributed to a desire of courting the people; for he constantly opposed Themistocles, and, at a subsequent period, Pericles and Ephialtes, who endeavoured to extend the power of the people. Cimon used his influence to preserve a good understanding between the Athenians and Lacedæmonians, by the latter of whom he was much beloved, and whom he sought to imitate. About 463 B.C., the Thasians having revolted, he defeated them, took possession of their city and of their gold-mines on the neighbouring continent, and founded the city of Amphipolis. Scarcely had he returned to Athens when Pericles and the other popular leaders accused him of being corrupted by the King of Macedon. But the people rejected so groundless an accusation. An insurrection of the Helots having broken out during the enterprise against Thasos, the Lacedæmonians sought the assistance of the Athenians, who were induced by Cimon to send them aid. The Lacedæmonians, however, fearing the inconstancy of the Athenians, sent back their troops, and thus excited their displeasure. Pericles and Ephialtes had also profited by Cimon's absence to take the jurisdiction in a multitude of cases from the Areopagus and transfer it to the Heliasts, thus giving an immense power to the inferior classes. Cimon endeavoured in vain on his return to place matters on the old footing. His enemies therefore took advantage of the popular discontent to which that subject had given rise to procure his banishment. He retired into Bœotia. Soon after (B.C. 457), when the Athenians advanced to Tanagra in order to dispute the passage of the Lacedæmonians, who were returning from Delphi, which they had freed from the Phocians, he appeared with his tribe, prepared to fight. This, however, he was not allowed by the generals to do. In departing he urged his friends to show by their conduct the groundlessness of the accusation brought against him of favouring the Lacedæmonians, and nearly all of them fell fighting with the greatest bravery. Although the Athenians lost this battle, they still continued the war till 456 B.C., when, the Helots being entirely subdued, the Athenians feared that the whole power of Lacedæmon would be turned against them. They recalled Cimon, who concluded a peace. In 449 Cimon besieged the city of Citium in Cyprus, but died before the place.

CINCHONA, or CHINCHONA, an important genus of evergreen trees or shrubs, type of the natural order Cinchonaceæ (see next art.), yielding the famous Peruvian bark which contains quinine, cinchonine, and other alkaloids, so well known for their valuable medicinal properties. They are natives of a considerable portion of the northern half of South America, and some of them reach a great size. Their leaves are similar in appearance to those of the laurel, their flowers are white or pink and fragrant. Among those whose bark is richest in the useful alkaloids are *Cinchona officinalis*, *C. Calisaya*, and *C. succirubra*. (See BARK, PERUVIAN.) Much has been written on the subject of the Cinchona by Sir Clements R. Markham (who introduced its cultivation into India) and others.

CINCHONACEÆ, a well-marked order of plants, almost exclusively found within the tropics. Leaves simple, entire, opposite, with interpetiolary stipules. Flowers arranged usually in panicles or corymbs. Calyx adherent, with a definite number of divisions, or none. Corolla superior, tubular, regular, with a definite number of divisions. Stamens arising from the corolla, all on the same line, and alternate with its segments. Ovary inferior, surmounted by a disk, usually two-celled, occasionally with several cells; style single, inserted, sometimes partly divided; stigma usually simple, sometimes divided into a number of parts. Fruit inferior, dividing into halves, or not dividing, and dry or succulent; sometimes many-celled. Many of the species of this order are of considerable importance, being largely used in medicine, acting as tonics, febrifuges, emetics, and purgatives. The species of *Cinchona* yield Peruvian bark (see BARK, PERUVIAN). An extract, with some sweetness and a more astringent taste than Terra Japonica, and called by the Malays Gambeer, is obtained from the *Uncaria Gambir*. Ipecacuanha is the root of *Cephäelis Ipecacuanha*, a little, creeping-rooted, semi-herbaceous plant, found in the damp forests of Brazil. Coffee is the seeds of a plant of this order, the *Caffea Arabica*. A few species bear an edible fruit, such as the Genipap of South America, the Nahil Peach of Sierra Leone, and the Voa-vanga, a good dessert fruit in Madagascar. Among dyeing plants there is the *Oldenlandia umbellata*, whose roots are the chay-root (which see) of commerce.

CINCHONINE ($C_{20}H_{24}N_2O$). This base is associated with quinine in all the true cinchona barks, but it occurs in greatest proportion in the gray varieties. The powdered bark is exhausted hot with acidulated water, the solution strained and cooled, and then magnesia, milk of lime, or carbonate of sodium added. The precipitate is drained and pressed, the fluids being preserved, and the cake is treated with alcohol, ether, or chloroform to separate the alkaloids; the exact process depending on whether the quinine or cinchonine be in greater proportion in the bark. Pure cinchonine forms colourless, shining, anhydrous, four-sided prisms. It is insoluble in cold water, and requires 2500 parts of boiling water for solution; it is insoluble in ether, and sparingly in alcohol and chloroform. It gives a bitter taste after a time; its soluble salts are very bitter. When heated it melts and sublimes, with partial decomposition. It is a tolerably stable body, not being acted on at once by ordinary chemical reagents. When exposed, however, to the action of chlorine and bromine it gives basic substitution compounds; and when heated with potash, the base chinoline (which see). Cinchonine has a strong alkaline reaction; it neutralizes the acids, and forms a large number of single, double, and acid salts, many of which are crystalline. In its physiological action cinchonine is the same as quinine, and may be used instead of the latter.

CINCINNATI, a city of the United States, in Hamilton county, Ohio, on the north bank of the river Ohio, 270 miles S.E. of Chicago by rail; pop. in 1840, 46,338; in 1880, 255,139; in 1900, 325,902. It was first regularly laid out in 1789. It occupies chiefly two terraces, the first about 50, the second 108 feet above the river, and has opposite to it in Kentucky the cities of Covington and Newport with several villages, which are reached by great iron bridges. The central part of the town is very compact, and a great portion of the houses are handsomely built of freestone, white limestone, or brick. Excepting on the margin of the river it is regularly laid out, the streets, &c., crossing each other at right angles. The finest portions of the city are now on the semicircle of hills which surround the original site, forming a series of highly picturesque suburbs. The city has two extensive parks besides a zoological garden. Among the chief buildings may be mentioned the post-office, the chamber of commerce, the exposition building and music-hall, the art museum and art school, the court-house, the city hall, several of the churches, especially the Roman Catholic cathedral, not to mention hotels, and business premises. Cincinnati is an important educational centre, there being a number of medical and other colleges, besides a university, and it is also a centre of art and music. The art school has 400 pupils, and possesses valuable paintings and sculptures. Artistic wood-carving is successfully carried on. The free public library contains 150,000 volumes. Cincinnati is an important manufacturing place; its industrial establishments including furnaces and forges, manufactories of hardware, cutlery, woollens and cottons, tobacco, leather, saddlery, cordage, paints, drugs, carriages, waggons, furniture, &c. The printing and publishing trade is of considerable importance. Few places are so well provided with means of transport. In addition to the fine broad river which fronts it, railways and canals stretch from it in every direction for thousands of miles, giving it all the means of communication requisite to facilitate its large and constantly increasing traffic. In particular, its railways connect it with every port on the great lakes from Chicago to Niagara, and with Albany, Boston, New York, Philadelphia, and Baltimore. The internal trade, it is almost needless to add, is very extensive. There are upwards of fifty daily and weekly newspapers published (several in German), and a number of periodicals, monthly and semi-monthly. On 28th March, 1884, a serious riot broke out in the city owing to the alleged escape of murderers from justice by bribery, and the outbreak was not suppressed until over 100 lives were sacrificed.

CINCINNATUS, Lucius Quinctius, a patrician belonging to the earliest period of the Roman Republic, born about 519 B.C. The legend which makes him the beau-ideal of the virtuous Roman is as follows:—The Romans of his day were weakened by dissensions between the patricians and plebeians; the warlike Æquians, after making harassing incursions into their territory, succeeded at last in surrounding the Roman army under the consul Minucius in the wooded grounds of Mount Algidus. In despair the Roman senators went to Cincinnatus, offering him the dictatorship. The messengers found him at the plough. Reluctantly he accepted the office. He succeeded in rescuing the army from its perilous position, and marched to Rome laden with the spoils of victory. He then returned to his farm, whence he was again called at the age of eighty to resume the dictatorship, to oppose the machinations of Spurius Mælius, and prevent a civil war between the upper and lower classes, which he succeeded in doing. Niebuhr does not credit the legend, but regards him as a violent opponent of the claims of the plebeians.

CINNA, Lucius Cornelius, an adherent of Marius, who obtained the consulship along with Octavius. This colleague's party and his coming to blows, the latter were conquered and driven from the city. He flew to the allies, collected thirty legions, called the proscribed to his support, and among these Marius, made himself master of Rome, and assented to the plan of Marius to put to death all the senators who were opposed to the people. This massacre continued for five days. The following year he, together with Marius, arbitrarily assumed the consulship. Sulla now appeared, and Cinna wished to march against him, but his soldiers refused, and put him to death (B.C. 84).

CINNABAR. See Mercury.

CINNAMON, the bark of the under branches of a species of laurel (*Cinnamomum Zeylanicum*), which is chiefly found in Ceylon, but grows also in Malabar, and other parts of the East Indies. This tree attains the height of 20 or 30 feet. Its leaves are oval; the flowers are of a pale yellow colour, and the fruit is shaped somewhat like an acorn. There are two principal seasons of the year in which the Ceylonese bark the cinnamon trees. The first of these commences in April, and the last in November; the former being that in which the great crop is obtained. In this operation the branches of three years' growth are cut down, and the outside pellicle of the bark is scraped away. The twigs are then ripped up lengthwise with a knife, and the bark is gradually loosened, till it can be entirely taken off. It is then cut into slices, and on being exposed to the sun, curls up in drying. The smaller pieces, or *quills*, as they are called, are inserted into the larger ones, and these are afterwards tied into bundles. Cinnamon is examined and arranged according to its quality by persons who, for this purpose, are obliged to taste and chew it. This is a very troublesome and disagreeable office, few persons being able to hold out more than two or three days successively. After this examination, the bundles are made up to the length of about 4 feet, and weigh about 88 lbs. each. From the roots of the trees numerous offsets shoot up. These, when they have attained the height of about 10 feet, are cut down and barked, being then about the thickness of a common walking-stick. The cinnamon which they yield is much finer than any other. In Ceylon the cinnamon-trees are said to be so common as to be used for fuel and other domestic purposes. The smell of cinnamon, particularly of the thinnest pieces, is delightfully fragrant, and its taste pungent and aromatic, with considerable sweetness and astringency. If infused in boiling water in a covered vessel it gives out much of its grateful flavour, and forms an agreeable liquid. An oil is extracted from cinnamon, which it heavier than water. This is prepared in Ceylon, and almost wholly from the small and broken pieces. It is made, however, in such small quantity that the oil of cassia is generally substituted for it: indeed, the cassia bark is often substituted for cinnamon, to which it has some resemblance, although in its qualities it is much weaker. The leaves, the fruit and the root of the cinnamon plant all yield oil of considerable value. That from the fruit is highly fragrant, of thick consistence, and at Ceylon was formerly made into candles for the sole use of the king.

The oil of cinnamon consists mainly of *cinnamic aldehyde*, C_9H_8O, which when pure is colourless. By exposure to air it absorbs oxygen, and is converted into *cinnamic acid*, $C_9H_8O_2$. This acid occurs naturally as a crystalline deposit, forming in oil of cinnamon, and it is contained besides in certain balsams, as of Peru and Tolu, in storax, and some other substances. It has also been prepared artificially from oil of bitter almonds. The acid forms colourless monoclinic prisms, sparingly soluble in cold water, readily in hot, and in alcohol and ether. It combines with the metals, forming *cinnamates*, a large class of crystallizable salts; with alcohol radicles to form ethers, some of which occur naturally, for instance styracin (cinnamate of cinnyl), found in storax. It also forms chlorine and nitro-substitution compounds, possessed of sufficient acid properties to form salts with a few metals.

CINNAMON STONE is a variety of garnet, and is a silicate of aluminium and calcium. It is found massive, but also in large separate crystals belonging to the regular system, with rhombic faces. Its colour resembles that of cinnamon-bark; it has a resinous and vitreous lustre when fractured, and the whole stone seems full of the finest fissures. It is found in Aberdeenshire in Scotland, and in different localities in Ireland; on the Continent, in America, and in Ceylon. The finer kinds are cut and polished, and used as gems.

CINO DA PISTOIA, an Italian jurisconsult and poet; born in 1270 at Pistoia. He ranks amongst the best of the early Italian poets, and resembles Petrarca more than any of the other predecessors of this poet. His poems were first published at Rome in 1558 by Pilli. They afterwards appeared at Venice increased by a second volume, which, however, was not considered genuine. The most complete edition is that of Ciampi (Florence, 1812, second edition), with the author's life.

CINQ-MARS, Henri Coiffier de Ruzé, Marquis de, favourite of Louis XIII., was born in 1620, and introduced at court by Cardinal Richelieu. He quickly gained the intimate friendship and confidence of the king, who made him master of the robes and grand equerry of France when only in his nineteenth year. His ambition, however, prompted him to obtain a footing in the management of public affairs, an attempt in which he was foiled by the cardinal, who also rudely interdicted his marriage with the beautiful Maria di Gonzaga, princess of Mantua. These repulses exasperated Cinq-Mars, who concocted a plot for the overthrow of Richelieu, to which the king himself was a party. Apprehensive of the fickle temper of Louis XIII., the conspirators entered into a secret treaty with Spain, with the view of securing their own safety should they be deserted by the king. This suspicion was but too well founded. Louis found himself so involved with Richelieu, that to propitiate him he sacrificed his favourite, and caused him to be arrested at Narbonne, along with a friend of his, the young Councillor De Thou. The two were conveyed, first to the castle of Perpignan, and afterwards up the Rhone to Lyons, where Cinq-Mars and his companion were beheaded on 12th September, 1642.

CINQUE PORTS, seven ports of England, on the coasts of Kent and Sussex—Dover, Sandwich, Hastings, Hythe, Romney, Winchelsea, and Rye. They were originally only five, the two latter having been declared ports subsequent to the first institution; hence the name *cinque*, five. They were granted special privileges by the later Saxon and earlier Norman kings, on condition of providing a certain number of ships during war, there being no permanent English navy previous to the reign of Henry VII. Before the passing of the reform act of 1832 they returned sixteen members to Parliament, but from that time Hastings, Dover, and Sandwich (with Deal and Walmer) returned two members each, Rye and Hythe returning one each; while, since 1885, Hastings, Dover, and Hythe alone remain parliamentary boroughs, with one member each. The ports are, collectively, in the jurisdiction of a lord warden, whose office, though the salary is £3000 a year, is little more than a sinecure.

CINTRA, a town, Portugal, province Estremadura, 15 miles W.N.W. Lisbon, on the slope of the Sierra de Cintra. The country around is extremely beautiful, and the climate mild and agreeable. On these accounts it is much resorted to by the wealthier inhabitants of Lisbon, who have here their *quintas* or country houses. The kings of Portugal have a palace at Cintra, with fine gardens ornamented with fountains. Cintra is celebrated for the convention entered into there in 1808, by which the French, after their defeat at Vimeira, were not only permitted to leave Portugal, but were conveyed to France with their arms, artillery, and property. Pop. (1890), 4846.

CIOTAT, La, a seaport of France, dep. Bouches-du-Rhône, on the Mediterranean, 15 miles S.E. of Marseilles. It has a safe and commodious harbour, and carries on a considerable trade in the productions of the district. The yards and workshops of the Messageries Maritimes company employ about 3000 hands. The town, surrounded by its old ramparts, consists of well-built houses and spacious well-paved streets. The surrounding district yields wine, oil, oranges, &c. Pop. (1896), 10,980.

CIPHERS are signs for numbers (see Notation). They are either borrowed signs, as letters, with which the Greeks and several tribes of the north of Europe designated their numbers; or peculiar characters, as the modern or Arabic ones. The ciphers, such as they are at present, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, did not attain their present character till a pretty late period. We have them from the Arabians, who derived them from Hindustan. It seems probable that the Egyptians were acquainted with the present system of ciphers, at least in its principles. As early as the ninth century ciphers were used, though seldom, in France. Not until the eleventh century did their use become common in Europe.

Cipher is also the name given to various methods of writing in secret characters. (See Cryptography.)—A kind of monogram, in which the initial letters of the Christian and family names of a person are entwined within each other, has the same name.

CIPRIANI, Giambattista, a painter and engraver, born at Pistoia in 1732; died at London in 1785. He was one of the first fellows of the Royal Academy. His drawing is correct, his heads have grace and loveliness, his colouring is harmonious, and the general impression of his composition very good. Many fine engravings of Bartolozzi are from the designs of Cipriani.

CIRCARS, The Five Northern, an ancient division of the Madras presidency, on the east coast of Hindustan, extending from lat. 15° 40′ to 20° 17′ N.; lon. 79° 12′ to 85° 20′ E. The Northern Circars were formerly Chicacole, Rajahmundry, Ellore, Condapilly, and Guntoor; but the districts that now correspond most nearly with them are those of Ganjam, Vizagapatam, Godavari, and part of Krishna. They were among the earliest of the territorial possessions of the East India Company, which acquired four of them in 1765, from Mogul Shah Allum, who bestowed them on the Company as a free gift. The fifth, Guntoor, came into our possession in 1788.

CIRCASSIA, or **Tcherkessia**, a region in the south-east of European Russia, lying chiefly on the north slope of the Caucasus, partly also on the south, and bounded on the west by the Black Sea. It forms part of the government of the Caucasus (see Caucasus), including a great portion of the territory of the Kuban and the districts of Sukhum and Tchernomore, but is not itself an official division; and indeed the name is now much less seldom heard than formerly, since the country has been entirely incorporated with the rest of the Russian possessions in this quarter, and has no longer a separate political existence. The whole region is mountainous, and is composed of the northern masses or western off-shoots of the great chain of the Caucasus, the culminating heights of which are those of Mount Elbruz. The mountains are intersected everywhere with precipitous ravines, in the deepest hollows of which flow rock-impeded streams that occasionally become raging torrents. The chief rivers are tributaries of the Kuban and the Terek, the first of which bounds the territory on the N.E. and E. sides, while the Terek skirts the Circassian limits on the S.E. side. Circassia is a beautiful though rugged country. The sides of the mountains are often clothed with thick forests, which form one of the natural sources of wealth of the country. Its climate is temperate, its inhabitants healthy and long-lived. There are few manufactures and little trade.

On Russia getting possession of this region the exodus of the inhabitants left but comparatively few Circassians proper, and those who remained have now to a large extent lost their national peculiarities. The people call themselves Adighé; the Tartar word *Tchertkess* being a slanderous name applied to them as 'robbers.' The Circassians were divided into several tribes, having three distinct languages, or more. Each tribe included five ranks of men, viz. princes or chiefs (*pshat*); nobles (*vork*); middle class (*thlofokl* or *tokavs*); serfs, or retainers of the nobles; and slaves—the latter being prisoners taken in war, or the descendants of such. All classes, except the slaves, were united into fraternities, for mutual support; and this union formed the real groundwork of the government of the country, which was altogether peculiar, being patriarchal in nature, with a great amount of freedom. Hereditary feud, once prevalent, was latterly almost extirpated, and pecuniary compensation, including a mulct upon manslayers for the benefit of the deceased's fraternity, was substituted. Crimes of all degrees, and civil causes, were judged either in general or local councils; and petty offences by district judges and assessors.

The religion of the country was chiefly Moslem; but in many cases a jumble of Christian, Jewish, and heathen traditions and ceremonies. In no case was it very strict; although most of the chief Mohammedan feasts and fasts were pretty well observed. The morals of the people were, nevertheless, respectable. Great crimes were rare; and such as have their source in poverty with one class, and avarice in the other, were not common, for property was little coveted, and money was scarcely known The commerce of presents was universal; few or none were very rich, and there were no miserably poor at all. There was no tenure of land in Circassia but what immediate possession, for the purposes of cultivation, gives.

Agriculture here is still in a rude state, but the produce of the tilled lands is considerable, and exceeds local wants. The forests yield great quantities of fine wood, including oak, and all our own best species of timber trees, with (in the southern regions) boxwood, &c. The chief grain is millet; but barley, oats, and a little wheat are also raised. There are great numbers of goats, sheep, and oxen.

The Circassians, male and female, are a comely and shapely race. The males are highly prized as warriors by the Russians, and the females as mistresses by the Turks, a position generally envied by the women themselves. The men are among the finest equestrians in the world; and their horses, though small, are of good make, hardy, and intelligent.

The early history of the Circassians is obscure. They have no annals; but their minstrels, in their martial and genealogical strains, preserve traditional accounts of the deeds and lineage of their dead heroes and existing tribes. Between the tenth and thirteenth centuries this country formed a portion of the Empire of Georgia, and it is said the Georgian queen Tamar subjected and for a time Christianized them. During the middle ages the Genoese had several trading stations on the coast, of which some memorials yet exist. In 1424 the Circassians were an independent people, and at war with the Tartars of the Crimea, &c., to whose khans, however, it is understood some were occasionally tributary. In 1555 the Muscovite czar, Ivan Vasilievitch, came to their aid against the Tartars, and married a Circassian princess. But the stay of the Russian forces was short, and after their withdrawal the belligerents kept up a struggle with varying results till 1705, when the Tartars were finally defeated in a decisive battle. Shortly thereafter the territorial encroachments of Russia on the Caucasian regions began. From that time she advanced by steps slow and stealthy, and in 1781 obtained a frontier line on the right bank of the Kuban, the left banks of which formed the national limit of Circassia. In 1784 the Turks founded Anapa, near the N.E. corner of the Black Sea, as a place of trade for their commerce and that of the Circassians: this was the only territorial settlement they as yet had in or near the country, and the place was a mere factory. In 1807 the Russians took Anapa from the Turks; but in terms of the Treaty of Bucharest, in 1812, it was restored. In 1829 it was once more taken by the Russians, and finally ceded to them by the Treaty of Adrianople, along with the whole of Circassia!—as they interpreted the words of that cunningly ambiguous document; the fact being that not an inch of the territory of Circassia proper had ever been in the possession of either Turks or Russians. Many of the Circassians were, indeed, Mussulmans, and all such recognized the padisha (sultan) as their *spiritual* head, but nothing more. As the 'hated Muscovites' (*fana Moscov*) immediately proceeded to act upon the pretended cession, a struggle commenced which was continued over a long series of years. The spirit of resistance to Russia became stronger than ever; and a bold leader, Schamyl, who united in his person the imputed sanctity of the hierarch with the daring courage and prudent conduct of a great warrior, with his heroic band beat off or baffled the whole disciplined forces that Russia was able to send against him. But at length the protracted resistance of the gallant people terminated in the triumph of the more powerful of the two foes, and the Circassians with their leader surrendered. Large numbers of them, as many it is said as 500,000, were deported into the Turkish provinces (1864) and were settled both in Asia Minor and in Bulgaria and Servia. A considerable portion of their former country was thus almost denuded of inhabitants.

CIRCE, a fabled sorceress who lived on the island of Aeaea. Ulysses in his wanderings landed on her island, and sent out Eurylochus with a party to explore the country. They arrived at the palace of Circe, who gave them food and wine, and with her magic wand changed them into swine. Eurylochus only, by cautiously abstaining from the magical potion, escaped the transformation, and informed Ulysses of the event. He immediately proceeded himself into the country to free his companions. On the way Hermes (Mercury) met and advised him. Following the advice of Hermes he then ran upon her with his drawn sword, threatening her with death, and compelled her to bind herself by an oath to do him no injury, and deliver his companions. Ulysses then remained with her a whole year. Before his departure she told him that in order to secure a safe return to his country he must visit the infernal regions and ask advice of Tiresias. This he did, and again visited Circe on his way back.

CIRCLE, IN GEOMETRY, a plane figure contained by one line, which is called the *circumference*, and is such that all straight lines drawn from a certain point (the *centre*) within the figure to the circumference are equal to one another. According to this definition of Euclid, which is remarkable for its perspicuity and precision, the *circle* is the space inclosed, while the circumference is the line that bounds it. The circumference is, however, frequently called the circle. Still no confusion ever arises from this usage.

The properties of the circle are investigated in books on geometry and trigonometry. Properly the curve belongs to the class of *conic sections*, and is a curve of the *second order*.

The celebrated problem of 'squaring the circle' has given rise to extraordinary geometrical labours, and even now there are to be found, as in the case of the problem of perpetual motion, those who profess to have solved it. The question is to find a square whose area shall be equal to the area of the circle. It is not possible to do so. All that can be done is to express *approximately* the ratio of the length of the circumference of the circle to the diameter, and to deduce the area of the figure from this approximation. This ratio has, however, been determined to a degree of exactness more than sufficient for all practical purposes. If the diameter be called unity, the length of the circumference of the circle is 3·1415926535...; and the area of the circle is found by multiplying this number by the square of the radius. Thus the area of a circle of 2 feet radius is 3·14159 × 4, or 12·56636 square feet approximately.

For trigonometrical calculations the whole circumference of the circle is divided into 360 equal parts or arcs, called degrees; each degree is divided into 60 minutes, and each minute into 60 seconds. The angles subtended at the centre by these arcs are called respectively degrees, minutes, and seconds of angle.

CIRCLE, in Practical Astronomy, an instrument for measuring angles by means of a metallic circle accurately divided. The general principle is to have a telescope movable accurately in one vertical plane, and an arm attached to it which moves over the graduated circle placed in a parallel plane. The arm carries microscopes and verniers for reading off minutely the angle it has traversed.

There are two great classes of these instruments, the *transit circles* and the *mural circles*, which are described elsewhere; and there are other less important instruments of this kind.

CIRCLE, in logic, the fault of an argument that assumes the principle it should prove, and afterwards proves the principle by the thing which it seemed to have proved. The same fault takes place in definitions when an idea is defined by others which suppose the knowledge of the first. Arguing in a circle is a fault into which men are very liable to fall, particularly in theological discussions.

CIRCLE, Astronomical. The heavens being considered as a spherical surface drawn round the earth as centre, an imaginary line drawn round the heavens so as to lie in one plane is a circle of the sphere. It is a *great circle* if the plane of it passes through the centre; thus the celestial equator and the ecliptic are great circles: if the plane of the circle does not pass through the centre it is called a *small circle;* all circles of declination except the equator are small circles.

CIRCLE OF CURVATURE. When a point in motion is tracing out any curved path, the direcition of motion changes from point to point of the curve, and the path is said to be more or less curved according as the direction of the motion of the point changes more or less rapidly. The *curvature* at any point is measured by the *rate* of this change at the point per unit length of the curve.

In the case of the circle the curvature is the same at every point; and it is easy to show that the curvature measured as above is equal to the reciprocal of the radius of the circle.

If we consider any small portion of any curve whatever, it may be approximately taken as an arc of a circle, the approximation being closer and closer to the truth as the portion considered is smaller and smaller, and by taking it small enough we may make the approximation as close as we please. The curvature is then the reciprocal of the radius of this circle.

The circle which coincides more nearly than any other with an infinitely small arc at any point of any given curve is generally found by means of the methods of the differential calculus. Such a circle is called the circle of curvature, and sometimes the *osculating* circle. The radius of it is called the *radius of curvature* of the curve at the point considered; and the centre of this circle is called the *centre of curvature.*

CIRCUITS, in England, divisions of the kingdom which the judges pass through at least twice or thrice a year in order to administer justice for the several counties. The counties of England and Wales are divided into eight circuits, those of Ireland into five; two judges go on each circuit. In Scotland the justiciary judges also make at least two circuits in the year, the kingdom being divided into three districts—the southern, western, and northern. In America, the same name is given to the divisions of the county traversed annually by the judges of the supreme court of the United States, for the purpose of trying causes which fall within the jurisdiction of the national courts.

CIRCULAR MOTION. A body in motion, which is continually impelled by some power towards a fixed point out of its original direction, is obliged to describe a curvilinear path round this point. A stone slung round by a string moves in a circle, because it is drawn toward the hand in every point of its path. The moon moves in a circle round the earth, because it gravitates towards the earth, and is thus drawn from the rectilinear direction which it would otherwise pursue. In such cases the point to which the body constantly tends is called the *centre of the forces;* the force itself, by which it is impelled, is called the *centripetal force;* that by which it strives to fly from the centre is called the *centrifugal force;* and the motion which is produced by these two forces the *circular motion.* All the planets in the solar system are carried round the sun, and the satellites round their planets by these forces. (See Central Forces.) The theory of circular motion is a subject of celestial mechanics, on which Newton composed his Principia Mathematica Philosoph. Natural., and Laplace his Mecanique Celeste, &c.

CIRCULAR PARTS, Napier's Rule for. A rule invented by Baron Napier of Merchiston, near Edinburgh, for the solution of all cases of right-angled spherical triangles, eminent for its comprehensiveness and utility in extensive surveys, navigation, and practical astronomy. See Trigonometry.

CIRCULAR POLARIZATION OF LIGHT. Plane-polarized light is altered into circularly-polarized light by passing in a particular direction through a Fresnel's rhomb. This is a parallelopiped of glass with its faces set at certain angles depending on the refractive power of the glass. The light entering one base of the rhomb is twice internally reflected before it emerges at the opposite base; and while common unpolarized light passes through the rhomb without suffering alteration, plane-polarized light has its properties in general completely altered. The final result depends on the inclination of the plane of polarization of the incident light to the plane of the internal reflections. In two cases, namely, when this angle is 0° or 90°, the emerging light is still plane polarized; when the angle is 45° the light is circularly polarized; in every other case it is elliptically polarized. In the first case, as will be understood from consulting the article on Polarization of Light, the *analyzer*, on being applied to test the beam, shows in one position bright light, and on being turned round the principal axis through 90°, total darkness. In the last case—that of elliptic polarization—the analyzer shows, on being turned round, a beam of varying intensity, but never complete extinction. In the case of circularly-polarized light the analyzer on being turned round shows a beam of the same intensity in every position of the analyzer, and, in fact, does not at first sight differ from ordinary unpolarized light. When, however, it is examined—not with a Nichol's prism direct, but after a second Fresnel's rhomb has been interposed—it is found to differ very remarkably from unpolarized light. The latter is, as we have remarked, unaffected by the rhomb; the circularly-polarized light emerges from the second rhomb plane polarized. It is thus shown how to produce and how to recognize circularly-polarized light. We now give a few of its most remarkable properties.

The light, as we have said, that emerges from the second Fresnel's rhomb is again plane polarized, but it does not emerge precisely as it entered. For, except in one particular position of the two Fresnel's rhombs, the light that emerges from the second rhomb has its *plane of polarization changed;* the plane is turned round, in fact, through an angle depending on the positions of the two rhombs with regard to the original plane of polarization; and it may be turned round either in a right-handed direction, as it is called (see below), or in a left-handed direction. We might arrange a set of pairs of Fresnel's rhombs, it is evident, in such positions that each pair should give the plane of polarization of the ray passing through it a farther twist in the same direction, and we might turn it thus through any angle whatever. Such a power as we have imagined in a set of Fresnel's rhombs is possessed by quartz and by a considerable number of solutions of organic bodies, and it is known as a power of rotating the plane of polarization. When a beam of *homogeneous* light has passed through the *polarizer*, and the analyzer is placed in the position of total extinction of the ray (see POLARIZATION OF LIGHT), on introducing a plate of quartz the light reappears; but on turning the analyzer round, either in a right-handed direction or in a left-handed direction (whence the names), extinction is again obtained. Quartz is named right-handed quartz or left-handed quartz, according to the direction in which the analyzer must be turned. The amount of the angle through which it must be turned depends on the thickness of the plate of quartz.

If, instead of using homogeneous light, as we have been supposing, plane-polarized white light is employed, it is found that the different rays are differently deviated. The effect on the more refrangible rays is greater than on the less refrangible, and the plane of polarization of the blue rays will thus be turned through a greater angle than that of the red rays. It will be perceived from this, that having arranged the polarizer and analyzer, and inserted a plate of quartz, as described above, on rotating the analyzer in the direction, right-handed or left handed, that corresponds to the nature of the plate of quartz, we shall not arrive at a position of total extinction, but we shall see a most beautiful play of colours changing in order from red to yellow, then to orange, green, and blue. These phenomena are among the most beautiful and the most striking of all the marvellous phenomena of light.

It has been remarked above that certain organic liquids and solutions have this rotatory power. Among these may be mentioned turpentine, some essential oils, solutions of sugar, and solutions of tartaric acid. This fact is taken advantage of in Soleil's saccharometer (which see), an instrument for determining the value of cane-sugar in a liquid.

One other matter connected with this most interesting subject. We have spoken above of the right-handed and left-handed properties of quartz; a discovery of Haüy leads us here to the very threshold of the molecular structure of crystals. We may yet hope for discoveries in this direction. On comparing crystals of quartz that give us right-handed and left-handed polarization, it is found that a very remarkable property connects their forms. The crystals that give right-handed and left-handed polarization are of an unsymmetrical construction, such that either viewed in a looking-glass gives an image of the same form as the other. Pasteur, examining the crystals of the two varieties of tartaric acid whose solutions have opposite rotational powers, but whose chemical properties are very nearly the same, showed that the same law holds for them; and having crystallized what is known as *neutral* tartaric acid, was able, by picking out the crystals by hand, to separate it into equal portions of *laevo* tartaric acid and *dextro* tartaric acid. But we must refer the reader to the special articles on the chemistry of this substance.

One of Faraday's most brilliant discoveries was the rotatory power of glass under the action of a powerful magnet. The reader is referred for an account of it to the article POLARIZED LIGHT.

CIRCULAR SAILING. See GREAT CIRCLE SAILING.

CIRCULATING MEDIUM. See CURRENCY.

CIRCULATION, in physiology, is a function peculiar to organized beings, and by means of which the perpetual and simultaneous movements of composition and decomposition manifested in organic life are carried on. From the simple fact that vegetables and animals are nourished by intussusception, circulation becomes one of their indispensable functions, since they must have organs which, on the one hand, take up the nutritive element at its point of contact with the surfaces, and carry it to the tissues where it is to be assimilated; while, on the other hand, these organs receive on the tissues the molecules of decomposition to transport them outwards. It is easy to conceive how the configuration and structure of the circulating apparatus must present modifications as varied as the form and composition of the species of individuals in which it is observed; but whatever be the differences presented by the circulation of a vegetable compared with that of a mammal, we are obliged to recognize in both only one same function, since in physics forms are nothing, and the only thing essential is the end to be attained.

The phenomenon of circulation in the superior animals was long unknown, and the vegetable circulation is a comparatively recent discovery. The ancients, who considered the heart as the reservoir of vital air, and the arteries as air-canals, had no distinct idea of the mode of distributing the blood; they thought that this liquid contained in the veins experienced an alternating movement of fluctuation, which they compared to the agitation of the waves of the Euripus. Aristotle, however, considered the heart as the source of the blood, which, according to him, was afterwards lost without being returned by the veins. Galen, who had observed the opposite directions of the blood in the arteries and veins, may be said to have been upon the very point of discovering the circulation; but many centuries passed away, and the honour of the discovery was reserved for our countryman, Harvey, by whom it was made in 1619. The obstacles which it encountered form a curious chapter in the history of the human mind; but the sublime truth worked its way till it was universally acknowledged, and effected a complete revolution in physiology. From the discovery of the circulation of the higher animals, that of the lower animals, though accompanied with new difficulties, arising from peculiarities of structure, necessarily followed; but even after this, circulation long continued to be regarded as confined exclusively to animals, and the movement of the sap in vegetables was not recognized as a true circulation till the microscope had unfolded its wonders. As the circulation of the higher animals, and particularly of man, is fully explained in the article HEART we shall here treat only of circulation in vegetables and in the lower animals.

Circulation in Vegetables.—Sap is to vegetables what blood is to animals. Both require a cellular tissue and vessels more or less complicated to be the reservoirs in which the nutritive fluid is elaborated. In the vegetable cells this fluid performs a true circulatory movement. It is confined to individual cells, and follows a more or less spiral direction. In the *Chara* of stagnant pools, the axis of the plant is composed of elongated cells placed end to end, surrounded by a number of smaller secondary cells, which are often encrusted with carbonate of lime. When the lime is carefully removed from these tubular cells, the intracellular movement of the sap is readily seen under the microscope; and still more advantageously in species of the allied genus *Nitella*, the cells of which are not encrusted with lime. A similar movement is seen in the leaves of *Vallisneria spiralis*, an aquatic plant found in ditches in the south of Europe, and cultivated in fresh-water tanks in this country; also in the leaves of *Anacharis Canadensis* (or *A. Alsinastrum*), abounding in ponds and streams in many parts of the country, having been introduced from America about the year 1836. Spiral movements of rotation are seen in the leaves, stipules, and hairs of other plants. The cause of the phenomenon has not been satisfactorily accounted for; but the *cellular circulation* is not connected with the general circulation of the sap. This circulation, unlike that of animals, does not exhibit movements of fluids to and from a common centre. Liquids are diffused throughout the plant by the mutual action of cells and vessels, having different functions. In the stem of a dicotyledonous tree, for example, the sap describes a sort of circle, not in determinate vessels, but by a definite course through different parts of the plant, passing upwards from the roots, through the newer woody tissue, and arriving at the leaves, where it is elaborated under the action of air and light; thence descending towards the exterior of the trunk, it becomes diffused in various directions, both internally and externally. A very simple experiment demonstrates this nutrition by the cortical tissue. Apply a close ligature to the tender bark of a young vegetable, and the parts situated above the ligature will acquire an exuberance of development, while those beneath it will cease to be properly developed. The sap undergoes in the different parts of the vegetable particular elaborations, which lead to the formation of immediate products, as milky, oleaginous, resinous, and other juices, in the same way as arterial blood furnishes material for the secretions of the different glands of the human frame. Observation has demonstrated that in spring and towards the end of summer the vegetable circulation is more active than at other periods of the year, and that in winter the diminution of its energy keeps pace with the lowering of the temperature. At certain degrees of cold the freezing of the sap ruptures the vessels and causes the death of those parts of the vegetable in which they are seated.

Circulation in the Lower Animal Forms.—The motion of a limpid fluid can be rendered perceptible only by the presence of the corpuscles which it carries. In the blood it is rendered apparent in the capillary vessels by means of its globules. In infusorial animalcules the movement of the fluids of the body is maintained by that of the animal itself and by the disturbing influence of nutritive absorption. In the Polypi the movement receives aid besides from the action of cilia on the inner walls of the body. The *annelids*, as the earth-worm, possess contractile vessels traversing the length of the body. The *insects*, *crustaceans*, *myriapods*, and *spiders* have a dorsal tube which in the common crab and the spider is much shortened and broadened, but in the others remains tubular, the blood regaining its cavity through slits in the sides as well as by the opens of the trunks which the heart gives off. In these animals the circulation is incomplete, that is, the blood does not flow through canals with definite walls but in the interstices of the tissues. The *Mollusca* have the heart provided with an auricle and a ventricle, as in the snail and whelk; two auricles, one on either side of the ventricle, as in the fresh-water mussel, or two auricles and two ventricles as in the ark shells. Among the ascidians, which stand low in that division of animals to which the molluscs belong, the remarkable phenomenon is encountered of an alternating current, which is rhythmically propelled for equal periods in opposite directions. All vertebrated animals (except *Amphioxus*) have a heart which in most fishes consists of an auricle and ventricle, but in the mud-fishes (*Lepidosiren*) there are two auricles and one ventricle; and this trilocular heart is found in the amphibians, and in most reptiles except the crocodiles, which, like birds and mammals, have a four-chambered organ consisting of two auricles and two ventricles. In these two last-named classes the venous and arterial blood are kept apart, in the trilocular hearts the two currents are mixed in the ventricle.

CIRCUMCISION, the rite enjoined upon Abraham as the sign of the covenant made by God with him and his posterity. Circumcision continued throughout the whole history of the Jewish nation a peculiarly distinctive rite. Not that the rite, whatever it may have been in its origin, continued to be exclusively Jewish, but that no other people adopted it with the precise restrictions which made it to the Jews a sign of their covenant. It was necessary to the efficacy of the Jewish rite that it should be performed on the eighth day after the birth of the child, and only male children were subjected to it. Other eastern nations have circumcised on various days, and some of them included females in the rite. So particular were the Jews to perform circumcision on the eighth day, that the Sabbath, about the observance of which they were strict even to superstition, was not allowed to interfere with it. There is some difficulty in determining whether the other eastern nations who have practised circumcision adopted it independently, or originally borrowed it from the Jews. It appears from Gen. xvii. 23 that not only Ishmael, but every male in Abraham's house, was circumcised, and probably his children by Keturah were so. The Arabians, who circumcise after the thirteenth year, are supposed to derive the rite from their ancestor Ishmael; and if the early Hebrews followed the example of Abraham, the custom may have been communicated to other families and tribes besides those of the patriarchs. Gen. xxxiv. may perhaps be taken to indicate such a tendency. There is no positive evidence that any eastern nation practised circumcision before the time of Abraham; but if the origin of the rite was supernatural, natural causes may have contributed to its propagation, as it is said to have a beneficial influence in moderating those passions which are known to be excessive in the East. Herodotus mentions its being practised among the Egyptians, and his testimony, as well as that of others, is conclusive on this point; although it throws no light either on the time of its introduction, or the extent to which it prevailed. It seems to have been less general than among the Jews, and was probably confined to the priestly caste. Christianity recognizes no religious significance in the rite, substituting for it, according to St. Paul, Rom. ii. 29, a 'circumcision of the heart'. It is still practised in many parts of the East, and, of course, has been retained by the Jews. It is not enjoined in the Koran, but has been adopted by the Mohammedans on the example of Mohammed himself, and is as common among them as among the Jews. The Abyssinian Christians are circumcised. It does not appear that the Moabites or Edomites, though descended from Abraham, practised circumcision. The custom exists among various African and American peoples.

Circumcision is also the name of a festival of the Christian church, celebrated on the 1st of January, in commemoration of the circumcision of our Saviour. The day was anciently celebrated as a fast, in opposition to the customs of the pagans, who feasted on it in honour of the god Janus.

CIRCUMNAVIGATORS, navigators who made voyages of discovery round the world. Magellan, a Portuguese, was the first of those intrepid men who, following in the path of Columbus, traversed the ocean from the east to the west, and, pursuing this direction, practically determined the globular form of the earth. Magellan was the first to enter the Pacific Ocean, but he did not live to complete the circumnavigation, being killed in 1521 at the Philippine Islands. The expedition set out in 1519, and the voyage occupied three years and twenty-nine days. In the passage through the Straits of Magellan, or round Cape Horn, into the southern seas, he was followed by the Spaniards (Fuca, Mendana, Quiros, and others, down to Malaspina), by the French (Bougainville, La Pérouse, and others, down to Freycinet), by the Dutch (Le Maire, Heemskerk, Hertog, Tasman, Roggewein), by Englishmen and Russians (from Deschneff to Krusenstern and Otto von Kotzebue), and lastly by North Americans. English vessels, as was to have been expected, made the most numerous and important of these circumnavigations. The first Englishman who made a voyage round the world was Sir Francis Drake, whose enterprise was directed more against the Spanish settlements on the Pacific than in the interests of geographical discovery. He sailed from Plymouth Nov. 13, 1577, reached the Straits of Magellan on August 20, 1578, passed through the straits, sailed up the coast of America as far as lat. 48° N., and, having taken much booty from the Spaniards, crossed the Pacific to the Moluccas, and latterly sailed home by way of the Cape of Good Hope, reaching Plymouth Nov. 3, 1580. The next English circumnavigator was Thomas Cavendish, who set sail from Plymouth 21st July, 1586, and reached the South Sea after a long and perilous passage through the Straits of Magellan. Having done what damage he could to the Spaniards, and taken more booty than he could carry home, he sailed across the Pacific, through the Malayan Archipelago, and so home by way of the Cape, reaching England 3rd Sept. 1588. The next English circumnavigations, by Cowley and Dampier, were about a century after these. Cooke and Clipperton followed early in the eighteenth century, and they were succeeded by Anson, who made a voyage round the world in 1740–44. Then followed the voyages of discovery by Byron, Wallis, and Carteret. The voyages of Cook, beginning in 1768, made a new era in circumnavigation. He twice circumnavigated the globe, in 1768–71 and again in 1772–75. The following is a list of the principal circumnavigators after Magellan:—Grijalva and Alvaradi (Spaniards), 1537; Mendana (Spanish), 1567; Drake, 1577–80; Cavendish, 1586–88; Le Maire (Dutch), 1615–17; Quiros (Spanish), 1625; Tasman (Dutch), 1642; Cowley, 1663; Dampier, 1689; Cooke, 1708; Clipperton, 1719; Roggewein (Dutch), 1721–23; Anson, 1740–44; Byron, 1764–66; Wallis, 1766–68; Carteret, 1766–69; Cook, 1768–71; Bougainville (French), 1766–69; Portlocke, 1788.

CIRCUMSTANTIAL EVIDENCE. See EVIDENCE.

CIRCUMVALLATION, or LINE OF CIRCUMVALLATION, in military affairs, implies a fortification of earth, consisting of at least a parapet and trench made round a place; a line or circle of field-works protecting some position.

CIRCUS, among the Romans, a large oblong building without a roof, in the open area or arena of which chariot-races and exhibitions of pugilism and wrestling, gladiatorial fights with wild beasts, and other public spectacles took place. It was nearly rectangular, the length being much greater than the width, but one short side or end formed a half-circle. At the opposite end were vaulted chambers (*carceres*), in which the chariots stood. Above these were seats for the magistrates. The main entrances to the arena were at either end. On both the sides, and on the semicircular end, were the seats of the spectators, rising gradually one above another, like steps, and resting on strong arches. At the foot of the seats there was a broad ditch (called *euripus*), to prevent the wild beasts from leaping among the spectators. Within was an open space (*arena*) covered with sand, where the games were exhibited. This space for a considerable distance was divided lengthwise into two parts by a low wall (*spina*), adorned with altars, statues, obelisks, and the like. At either end of the *spina* were three tall conical objects (*metæ*), which served as goals, round which the circuits of the chariots were made. Upon the spina, at either end, were also two structures supporting seven marble balls, called *ova*, from their resemblance to eggs. The use of these was to enable the spectator to count the rounds or laps run in the race, the complete number of which was usually seven. One of the ova was put up or taken down at each round. On the outside the circus was surrounded with colonnades, galleries, shops, and public places. The largest of these buildings in Rome was the *Circus Maximus*, which is said to have been not less than 2000 feet long by more than 600 in width. It was enlarged and improved by Julius Cæsar and subsequently by other emperors. According to Pliny, it was capable of containing 260,000 spectators, and according to Aurelius Victor, 385,000. At present but few vestiges of it remain. The circus of Maxentius is in the best preservation among those at Rome. See HIPPODROME.

The games celebrated in these structures were known collectively by the name of *ludi circenses* or 'games of the circus'. Games of this sort are said to have been exhibited by Romulus, and they certainly originated at an early date. Afterwards, by the mutual rivalry of the *ædiles*, who bore the expense, their splendour was increased. Under the emperors they attained the greatest magnificence. The passion of the people for these shows appears from the cry with which they addressed their rulers—*panem et circenses!* (bread and the games!). Originally the games had a religious character, and latterly during republican times there were seven sets of games exhibited annually at Rome on fixed occasions, those known as the *Ludi Romani* being the chief. The games were inaugurated with a grand procession, which started from the Capitoline Hill, and following a fixed route entered the circus by the gateway between the carceres. It was headed by one of the higher magistrates, sometimes by the emperor himself, after whom came a crowd of eminent citizens, partly on foot partly on horseback, and then the chariots and drivers who were to take part in the races. 'Next in order came priests, grouped in their various *collegia*, bearers of holy water, incense, and sacrificial implements, and statues of deities in chariots (*tensæ*) drawn by horses, mules, or elephants, or else borne in litters (*fercula*) on men's shoulders, and attended by noble youths.' After sacrifices had been duly offered the games began. Usually four chariots competed in each race, the vehicles—in earlier times at least—being either drawn by two horses (*bigæ*) or by four (*quadrigæ*). Latterly as many as eight or ten chariots might start together, and ten horses might be yoked to one chariot, a number that gave a driver a great opportunity for the exhibition of skill. The chariots were light structures, rising high in front and open behind. The drivers were slaves or men of low caste, and their calling was not considered honourable; though under the empire, and after emperors had not deemed the post of driver beneath them, wealthy Roman citizens were quite ready to accept it. Much betting went on at the races, and winning drivers often received enormous sums of money from their backers. The horses were carefully selected and trained, and usually did not begin to race till about five years old. As on a modern racecourse, cards (*libelli*) were sold, giving lists of horses and their drivers, and similar information was painted upon conspicuous walls. The *venationes*, or exhibitions of wild beasts that were made to fight with each other, or with men, were a favourite spectacle with the Romans. As early as B.C. 168 sixty-three panthers and forty bears and elephants were exhibited at the circus-games. When Sulla was prætor (B.C. 93) he exhibited a hundred African lions in the circus, which were killed by javelin-men specially brought over from Africa. At the *venatio* given by Pompey in B.C. 55, among the animals killed were 600 lions and eighteen or twenty elephants. The men who fought with the animals were often condemned criminals or slaves, but there were also men (*bestiarii*) specially trained for the purpose, who received pay. Such exhibitions were often given in the amphitheatre as well as the circus. The following particulars of what might be seen in the circus during the third century after Christ are given by Gibbon: 'By the order of Probus a great quantity of large trees torn up by the roots were transplanted into the midst of the circus. The spacious and shady forest was immediately filled with a thousand ostriches, a thousand stags, a thousand fallow-deer, and a thousand wild boars; and all this variety of game was abandoned to the riotous impetuosity of the multitude. The tragedy of the succeeding day consisted in the massacre of one hundred lions, an equal number of lionesses, two hundred leopards, and three hundred bears. The collection prepared by the younger Gordian for his triumph, and which his successor exhibited in the secular games, was less remarkable by the number than by the singularity of the animals. Twenty zebras displayed their elegant forms and variegated beauty to the eyes of the Roman people. Ten elks and as many camelopards, the loftiest and most harmless creatures that wander over the plains of Sarmatia and Æthiopia, were contrasted with thirty African hyænas and ten Indian tigers, the most implacable savages of the torrid zone. The unoffending strength with which Nature has endowed the greater quadrupeds was admired in the rhinoceros, the hippopotamus of the Nile, and a majestic troop of thirty-two elephants' (Decline and Fall, chap. xii.).

The modern circus is a place where equestrian performances, exhibitions of acrobats, and various pageantries, including a large amount of buffoonery, are presented. It is destitute of all the elements of dignity, grandeur, and dramatic power which relieved the frequent barbarity of the ancient circensian games.

CIRENCESTER (usually pronounced *sis-e-ter*), a town of England, in the county and 18 miles S.E. of Gloucester on the river Churn. It was founded by the ancient Britons, and subsequently, under the name of *Corinium*, became a Roman station. Various Roman remains, including those of an amphitheatre, have been discovered in it, and numerous relics belonging to this period of its history have from time to time been dug up, and deposited in the interesting local museum. The modern town, consisting of four principal and several minor streets, presents a pleasing appearance. The church of St. John Baptist, mainly in the Perpendicular style, has a lofty tower, and contains several interesting monuments; and there are several other interesting churches. The town also contains the remains of the gateway of an abbey founded in 1177; and the public buildings comprise the Corn Hall, Corinium Museum, cottage hospital, &c. In the environs is the well-known Royal Agricultural College, which accommodates a large number of students, who come from all parts of the world. The chief industries are malting, brewing, cutlery, and the curing of bacon. Cirencester was the scene of engagements during the Civil War of the seventeenth century. It returned one member to Parliament previous to 1885, and now gives name to one of the five parliamentary divisions of the county. Pop. of urban sanit. dist. in 1881, 7658; in 1901, 7536. Pop. of parl. div. (1901), 49,555.

CIRRIPEDES, CIRRIPEDIA, or CIRRHOPODA, the name of a class of marine invertebrate animals, constituting an order of entomostracous crustaceans, and consisting of those whose soft body is provided with very long articulated limbs, which are protruded and rapidly withdrawn within the multivalve shell. They are crustaceans which have undergone retrograde metamorphosis, the free-swimming larva becoming after a time attached by its head, and secreting a composite shell. They have been divided into two groups—the one called *sessile*, because their body has no peduncle, and is confined in a shell fixed on different marine productions, and often on the bottom of vessels in such numbers as seriously to interfere with their power of sailing; the other called *pedunculated*, because the body is supported by a tubular peduncle, and movable though fixed by its base. Of the first, the *Balanus* or acorn-shell is the best-known type; of the latter the *Anatifa* or goose-barnacle. Both groups are so widely diffused that there is scarcely a sea without them.

CIRRO-CUMULUS and **CIRRO-STRATUS**. See CLOUD.

CISALPINE REPUBLIC. After the battle of Lodi (May 10, 1796), Bonaparte, on the 20th of May, proclaimed the freedom of Lombardy, and formed of it the Transpadane Republic; at the same time the Cispadane Republic was formed of the provinces of Modena and Reggio taken from the duke, and Ferrara and Bologna from the pope; Romagna with two other legations ceded by the pope at the Treaty of Tolentino, 19th Feb. 1797, were afterwards added, but the whole was in the month of June united with the Transpadane Republic, under the name of Cisalpine Republic. By this name the Emperor of Germany recognized it as an independent power at the Peace of Campo-Formio (October 17). It comprised Austrian Lombardy, together with the Mantuan and the Venetian provinces, Bergamo, Brescia, Crema, Verona, and Rovigo, the duchy of Modena, the principality of Massa and Carrara, and the three ecclesiastical delegations—Bologna, Ferrara with Mesola, and Romagna. October 22, in the same year, the Valteline or Veltlin, Bormio, and Chiavenna, belonging to the Grisons, were added; so that the new republic, which was divided into ten departments, comprised 16,337 square miles and 3,500,000 inhabitants. The legislative body, composed of a council of eighty elders, together with another council of 160 members, and the directory (*directorium*), held their sessions in Milan. The army (French troops in the pay of the republic) amounted to 20,000 men. In March, 1798, it was more closely connected with France by a defensive and offensive alliance, and a commercial treaty. On the renewal of the war between Austria and France, in March, 1799, it was disunited for a short time by the successes of the Austrians and Russians, but soon restored by Bonaparte's victory at Marengo (June 14, 1800). The republic then received a deliberative body (*consulta*) of fifty, and an executive council (*governo*) of nine members. On the 6th of September it was enlarged by the addition of the Novarese and Tortonese, and at the Peace of Luneville (Feb. 9, 1801) was again acknowledged by Austria. January 25, 1802, it received the name of the *Italian Republic*, and elected Bonaparte president, and Francis Melzi d'Erile vice-president. From 1805 to 1814 it formed part of the Kingdom of Italy. It was given to Austria by the Congress of Vienna in 1815 as the Lombardo-Venetian Kingdom.

CISPADANE REPUBLIC. See Cisalpine Republic.

CISRHENISH REPUBLIC. Several towns on the Rhine, particularly Cologne, Aix-la-Chapelle, and Bonn, at the time when so many republics were created, declared themselves independent, under French protection, and took the title of *Cisrhenish Republic* in Sept. 1797. But at the Peace of Campo-Formio (Oct. 17, 1797), the left bank of the Rhine, including the Cisrhenish Republic, was ceded to France by a secret article, and the confederation bearing this name is in consequence hardly known.

CISTERCIANS, a religious order which takes its name from its original convent, Cîteaux (*Cistercium*), not far from Dijon, where the society was formed in 1098 by Robert, abbé of Solesme, under the rule of St. Benedict. Through the exertions of St. Bernard de Clairvaux it had increased so much 100 years after its origin as to embrace 1800 rich abbeys in different countries of Europe. The Cistercians dedicated themselves to a contemplative life. Their rule was severe. They succeeded in freeing themselves from the superintendence of the bishops, and formed a kind of spiritual republic. A high council consisting of the abbot of Citeaux as superior, the abbots of Clairvaux, La Ferté, Pontigni, and Morimond, all in France, and twenty other *definitores*, governed the body, under the immediate superintendence of the pope. In France they called themselves *Bernardines*, in honour of St. Bernard. Among the fraternities emanating from them, the most remarkable are the Barefooted monks, or Feuillants, and the nuns of Port Royal, in France; the Recollets, reformed Cistercians, in Spain; and the monks of La Trappe. Riches and indolence brought on the decline of this order. Many of their convents ceased to exist before the Reformation, still more afterwards, partly by gradual decay, partly by falling into other hands. The general fate of the religious orders during the period of the French revolution almost swept away the Cistercians, but they still have a few establishments in the United Kingdom and elsewhere. They wear white robes with black scapularies. See Feuillants, La Trappe, Port Royal.

CITADEL (from the Italian *cittadella*, a diminutive of *città*, city; signifying *little city*), in fortification, a kind of fort, consisting of four, five, or six sides, with bastions, commonly joined to towns, and sometimes erected on commanding eminences within them. It is distinguished from a castle by having bastions.

CITHÆRON, or Elatea, a mountain, Greece, which stretches N.W., separating Bœotia from Megaris and Attica. Its loftiest summit rises 4620 feet above the sea, and is the subject of numerous fables and classical allusions. On its northern slope stood the ancient city of Platæa, the circuit of whose walls may still be traced. Its modern name Elatea, from *elatē*, a fir, is derived from the pine forests with which it is crowned.

CITHERN (Latin *Cithara*, Greek *Kithara*), a musical instrument frequently referred to by the Greek and Latin poets. It was a lute of triangular shape, with seven strings, which were afterwards increased to eight or nine. The Spanish guitar derives its name from the cithern.

CITIES OF REFUGE. By the law of Moses six out of the forty-eight cities which the Israelites were directed to give to the tribe of Levi, in the division of the land of Canaan among their tribes, were to be set apart as cities of refuge for the manslayer or accidental homicide. The right of avenging murder belonged to the next-of-kin of the murdered man; but on the slayer fleeing to one of these cities, three of which were to be on either side of Jordan, the avenger of blood was forbidden to touch him till he stood before the congregation in judgment, when, if he was found to have acted without premeditation or malice, he had a residence appointed him in the city of refuge until the death of the high-priest, and was then permitted to return to his inheritance. If the slayer violated this regulation by leaving the city of refuge before the death of the high-priest, the avenger of blood might kill him with impunity. The six cities of refuge appointed in accordance with this law were Kedesh, Shechem, and Hebron on the west side of Jordan; and Bezer, Ramoth-Gilead, and Golan on the east. This law of refuge seems to have been favoured by the Levites, to whom it would give a measure of political influence, much in the same way as the privilege of sanctuary did to the monks, abbots, and other dignitaries of the Romish Church; it was consequently interpreted by them in the most liberal way. Maimonides says that all the forty-eight cities of the Levites had the right of refuge, although only the six were obliged to receive and lodge the slayer gratuitously.

CITIES OF THE PLAIN. See Sodom and Gomorrah.

CITRIC ACID ($C_6H_8O_7,H_2O$) was first separated and distinguished by Scheele in 1784. It is a very widely distributed acid, being present in most common fruits, such as gooseberries, currants, lemons, citrons, cherries, and many others. It is generally prepared from lemon-juice, the dark treacle-like fluid imported from Sicily, by fermenting it, filtering, and neutralizing with chalk and quicklime, by which citrate of calcium is precipitated. This, by decomposition with sulphuric acid, gives the acid, which is got pure by repeated crystallization. Several improvements have of late been introduced, both in preparing the crude lemon-juice for exportation and in the subsequent purification and crystallization of the acid. Citric acid is white when pure; it crystallizes in two forms, one belonging to the trimetric system is the common form, and in it the acid has one proportion of water. The other form is different, and the acid contains half the quantity of water. The ordinary crystals effloresce in the air, in a warm room.

Citric acid has a pleasant sour taste. It dissolves very readily in water, and is soluble in alcohol, but insoluble in ether. When heated it undergoes decomposition, and yields *aconitic*, *itaconic*, and *citraconic* acids, along with other products. It is acted on by nitric and sulphuric acids and by other reagents, yielding a variety of decompositions and derivatives.

Citric acid combines with the metals, forming *citrates*. They are crystalline salts, and many of them are soluble in water. Crude citric acid is largely employed by the calico-printer as a resist and as a discharge. See next article.

CITRON, a tree of the genus *Citrus*. *Citrus medica*, a small evergreen shrub introduced into the southern parts of Europe from Asia, is the citron proper. We import the fruit in a preserved state, and then usually the rind alone. It comes candied with sugar, or preserved in salt and water for the purpose of being candied here. The lemon is the fruit of *Citrus limonum*, a native of the Himalayan Mountains in India, and has long been cultivated in the south of Europe, whence several varieties of lemons are imported into Great Britain. The sweet orange is *Citrus aurantium*. now found in China, India, North and South Africa, South Europe, Turkey, islands of the Mediterranean, South America, &c. The bitter orange is *Citrus vulgaris*, known in Europe long before the last species. The shaddock (*Citrus decumana*) was introduced into the West Indies from China by Captain Shaddock. Another species, named *Citrus paradisi*, the forbidden fruit, is sometimes used in this country as an ornamental addition to the dessert; the pulp of the fruit is sweetish, and the rind is not so bitter as that of the shaddock. The genus Citrus furnishes the essential oils of orange and lemon peels; of orange flowers (*Oleum neroli*); of citron peel (*Oleum citronellæ*); of the bergamot orange (*Oleum bergamotæ*); and oil of the orange leaves, usually called *essence de petit grain*—all much esteemed in perfumery.

Lemon-juice, which is one of the sharpest and most agreeable of all acids, is used in cookery, confectionery, medicine, and various other ways. By calico-printers it is very extensively employed as a discharger of colour, to produce with more clearness and effect the white-figured part of coloured patterns dyed with colours formed from iron. The juice is procured by simply squeezing the fruit and straining it through linen or any loose filter; and in Sicily and other parts of the Mediterranean it forms an important article of commerce. Being one of the most valuable remedies for the scurvy, it generally constitutes part of the sea-stores of ships that are destined for long voyages. Several different modes have been recommended for the preserving of lemon-juice. One of these is to put it into bottles with a small quantity of oil, which, floating on the surface, prevents the immediate contact of the air and retards the decomposition of the acid, though the original fresh taste soon gives place to one which is less grateful. In the East Indies lemon-juice is sometimes evaporated by a gentle heat to the consistence of a thick extract. Sometimes it is crystallized into a white and acid salt; but what is sold in the shops under the name of *essential salt of lemons*, for taking out ink-stains and iron-mould spots from linen, is only a preparation from the juice of sorrel. The external part of the rind of the lemon has a grateful aromatic and bitter taste, which renders it useful in cookery. When dried it is considered a good stomachic, promotes the appetite, and is otherwise serviceable as a medicine. It is often candied and made into a sweetmeat, under the name of *lemon chips*. In distillation it yields a light and almost colourless oil, which is frequently employed as a perfume. Lemons are sometimes preserved in sirup. Small ones, with thick rinds, are converted into a grateful pickle. Marmalade and sirup are also made of them. For the purpose of keeping the fruit, it is recommended that a fine pack-thread, about ½ yard long, should be run through the protuberance at the end of the lemon. The ends of the string are to be tied together and suspended on a hook, in an airy situation, in such a manner that the lemon may hang perfectly free and detached.—The cultivation of the lime *Citrus Limetta*) a well-known species of this genus, like the lemon but much smaller, with a thin and very odorous rind, and very acid juice, is much attended to in several parts of America and the West Indies. Its juice affords a more grateful acid than that of the lemon.

CITTÀ, in geography, the Italian word for *city*, which is used in many proper names of cities, as *Città Castellana*, *Città Ducale*, *Città Nuova*, &c.

CITTADELLA, a town of Italy, in province of, and 15 miles north-east of Vicenza, on the Brentella, an affluent of the Brenta. It is surrounded by walls flanked with towers, and has manufactures of linen and paper. Pop. 7213.

CITTÀ-DI-CASTELLO (ancient *Tifernum*, *Tibernum*), a town, Italy, province and 25 miles N.N.W. Perugia, on the left bank of the Tiber. It is the seat of a bishopric, and has a cathedral in the renaissance style and various other handsome buildings. In 1798 the French captured the town from the Neapolitans, who had recently taken possession of it. Pop. 5587.

CITTÀ-VECCHIA, or CIVITA-VECCHIA, a fortified city of Malta, near the centre, and almost on the highest point of the island, 7 miles W.S.W. Valetta. The rise of the latter town has almost ruined it, and its magnificent houses and palaces are almost deserted. The cathedral, dedicated to St. Paul, a large and handsome edifice, from which a view of the whole island is obtained, is said to occupy the site of the house of Publius, who was Roman governor when the apostle suffered shipwreck. The catacombs, situated in the suburb Rabato, are among the most interesting objects of the place. They are excavated in the tertiary limestone of the island, and run a considerable way underground. The rudely sculptured cross which is on the roof of many of the tombs, and the inscription, 'In pace posita sunt,' leave no doubt that they were the work of the early Christians. Many of them were probably used for refuge. Città-Vecchia, while in possession of the Saracens, was called Medina; and in that of the Arragonese Notabile. The town also contains the ancient palace of the grand-masters of the Order of Malta. Pop. 4700.

CITY (Latin *civitas*). The Greeks and Romans distinguished a city from a town, or mere assemblage of people living together under municipal laws, as an independent community or state possessing sovereign authority, and including any portion of the surrounding territory the inhabitants of which possessed the rights of citizenship, but excluding conquered or dependent territories. Thus Athens, Rome, and Carthage were all both towns and cities in different senses. In Europe the word city came to have two meanings, the one civil, the other ecclesiastical. The civil meaning corresponded with the Roman sense, in which the great Italian republics and the German free cities during the period of their independence corresponded with it. The fluctuations in the fate of such cities must necessarily have caused the word to lose the sense of territorial independence, and this change would be promoted by the rise of rivals to them in other respects having no such claim, so that in modern times a city has come to signify merely a town holding from extent of population, favourable situation, or other causes, a leading place in the community in which it is situated. The ecclesiastical sense of the term city is a town which is the see of a bishop. This seems to be the historical use of the term in England, and still possesses some authority there, but in general use it has been superseded by the wider one. In our historical retrospect we take the term in its least restricted sense. The origin of cities belongs to the earliest period of history. According to Moses Cain was the first founder of a city, and Nimrod built three, among which Babylon was the most important. The Jews imagine that Shem erected the first city after the deluge. At the commencement of society the form of government was patriarchal. The ruler was the head of the family or clan. Relationship, the innate wish of men to live in society, and more, perhaps, than both these causes, the necessity of providing means of defence against more powerful clans, brought together separate families into one spot. The fertility of the East also afforded facilities for men to give up the rambling life of nomads and to form permanent settlements. These settlers began to barter with those tribes who continued to wander with their herds from place to place. Thus cities sprung up. These were soon surrounded with walls to prevent the inroads of the wandering tribes. The bond of connection between their inhabitants thus became closer, and their organization more complete. As by degrees the chiefs of these family-states died away, the citizens began to elect the most able or most popular men for magistrates, without respect to birth or descent. Thus political institutions began to assume a systematic character. The earliest form of government succeeding the patriarchal state was probably monarchical. In this the religious, paternal, and political authority remained rudely mingled. When conquest extended the limits of these early kingdoms the authority of the king was weakened, his connection with the different parts of his dominions became imperfect, and the progress of civilization was promoted almost solely by the growth of the cities. These gave rise to the division of labour, the refinements of social intercourse, the development of laws caused by the conflicting interests of many people living close together, the idea of equality of rights, the diminution of awe for a distant monarch, the growth of patriotism, springing from the sense of advantages enjoyed and the exertions necessary to maintain them. These were the salutary consequences of the establishment of cities. Under the mild sky of Asia, Africa, Greece, and Italy cities were built first, and in the greatest number. The Phœnicians and Egyptians particularly distinguished themselves by the erection of cities, which soon attained a high degree of wealth, and consequently of civilization. The Egyptians considered their city of Thebes older than any of the Greek cities; and Pliny says that Cecropia, said to have been erected in Attica by Cecrops, 1582 B.C., and afterwards called *Athens*, was the oldest city of Greece. Heeren justly remarks that the rise of cities was the most important source of the republicanism of antiquity. This is particularly true of Greece. In fact cities are, by their very nature, of a democratic tendency. Several confederations of cities existed in the ancient world; for instance, the Phœnician, consisting of the cities of Tyre, Sidon, &c., and the Achæan league, formed by the most important cities of Greece, in order to strengthen themselves against the power of Macedon. Under Augustus and his successors the Romans began to establish colonial cities in Germany, having done the same long before in Gaul, Spain, Africa, &c. In Switzerland they first erected cities about A.D. 70, which, however, were mostly laid waste by the Alemanni, and subsequently rebuilt under the government of the Franks (A.D. 496). The Germans, accustomed to a wild, rambling life, did not show any disposition to live in cities until Charlemagne laboured to collect them together in settled abodes from his desire to civilize them. Henry I. distinguished himself particularly in this way, and on this account has been called by some *Henry the City-builder* (*der Stadterbauer*). He gave the cities great privileges, in order to induce his subjects to live in them, and thus laid the foundation of that power which at a future period contributed most to break down the feudal system. In many cities imperial castles were erected to protect the inhabitants, and the insupportable oppressions and even cruelties exercised by the feudal lords upon their peasants, or by the wandering knights and robbers, drove many people into the cities. The attacks of the neighbouring lords gave firmness to their union, and compelled them to cultivate their resources. Commerce and the various arts and trades were soon cultivated within their walls, and their wealth and respectability increased. They soon became sensible of the want of a better system of laws and political administration than prevailed around them, and the principle of equal rights and laws was quickly developed.

One of the most important remnants, if not the most important, of the great fabric of ancient civilization, was the cities of Italy. In spite of their bloody contests with each other, and the vices of an oligarchical government, Europe is mainly indebted to them for the cultivation of the commercial spirit, together with the toleration and love of liberty, which, under the most unfavourable circumstances, it tends to foster, and for that ardour in the cultivation of arts, science, and literature, which has always distinguished the best periods of Italian history, and from which the general revival of learning in Europe, called the Renaissance, took its rise. Under the reign of Conrad III. (1138–52) the cities of Lombardy, and particularly Milan, which stood at their head, had acquired a high degree of wealth and power, and had formed themselves into a confederation. The struggles between the emperors and these cities form one of the most important portions of the history of the German Empire and of Italy. Frederick I. in vain demolished the powerful city of Milan. It was soon rebuilt, and the cities of Lombardy, in alliance with the pope, obliged the emperor to conclude with them a very disadvantageous peace at Constance. Two other confederations of cities, highly important, were formed during the *interregnum* of the German Empire, between 1256 and 1272. One of them was the powerful Hansa, or Hanseatic League (which see), the other the confederacy of the High German and Rhenish cities, from the foot of the Alps to the mouth of the Main, established by Walpode of Mentz in 1255. A similar confederacy, and a very important one, was that of the Suabian cities, instituted in 1488 to repel the outrages of the feudal lords and knights. The cities of the Netherlands, from their central position between France and Germany, exercised a powerful influence on the growth of civilization and political liberty in Europe. Their favourable situation and the enterprise of their inhabitants early gave them great wealth and power. The democratic spirit, ultimately carried to the greatest height in Holland, was earliest manifested in the towns of Belgium, which began in the twelfth century to manifest a turbulent disposition, and by frequently leaguing themselves with the enemies of their feudal superiors extended their political privileges, and acquired at times a premature independence, which, though ultimately extinguished in the spirit of nationality, contributed not a little to the breaking up of the feudal system. (See BELGIUM, NETHERLANDS, &c.) In Spain municipalities were established at an early date. Leon received a charter in 1020, Sepulveda, Lograno, Sahagun, and Salamanca followed soon after. The constitution of the Spanish towns approached more nearly to the ancient idea of a city than was common in other large states of Europe, in this resembling the Italian cities. Their constitution was extremely democratic, and they ruled over a large extent of surrounding territory, which they were bound to defend. Deputies from the towns were admitted to the cortes in the twelfth century (1167 and 1188). The love of liberty rose high in these ancient Spanish cities, but from the isolation of the Iberian Peninsula they exercised little influence in Europe, and they soon lost their power and importance, most of them by the end of the fifteenth century having ceased to send their representatives to the cortes. By degrees the cities acquired in the different countries of Europe the right of representation in the legislative bodies; and wealth, industry, knowledge, and equal laws spread from them through Europe. But the cities of Lombardy, though still flourishing and wealthy, had fallen, for the most part, under the rule of single families; their republican governments vanished, and their confederation was dissolved. The associations of German cities experienced a similar fate. By the Peace of Westphalia the princes of the German Empire were declared sovereign powers, and the more their authority increased the more did the relative weight of the cities diminish. These had formerly suffered from the oppressions of the feudal lords. They were now the victims of the policy of the neighbouring princes, whom envy often led to adopt the most unwarrantable measures against the cities, many of which had lost their independence before Napoleon dissolved the German Empire. He took away the privileges of those which remained free; and the Congress of Vienna restored freedom to Lübeck, Hamburg, Bremen, and Frankfort, only because the different powers could not agree to whom they should be assigned. At the same time Cracow was declared an independent city, with a republican form of government.

Cities, as we have seen, naturally develop the democratic principle, and on this and several other accounts are to be considered among the firmest supports of liberty. Well-organized municipal institutions, in which the government is in the hands of the citizens, afford continual nourishment to the spirit of freedom throughout a country.

Much has been said and written upon the immorality of large cities, and it cannot be denied that they have vices peculiar to themselves; but it must be considered, on the other hand, that they are free from many of those of petty towns, and even of rural districts. The association of men in masses, when due surveillance is exercised, has an influence distinctly favourable to the maintenance of social order, the impartial administration of justice, and, above all, the suppression of all petty and local tyrannies, and the maintenance of individual liberties. It is by the influence of cities alone that a sufficient organization for the support of education and the means of enlightenment is obtained, even though that organization often fails to penetrate the entire mass of the cities themselves. It is to them that many of the facilities for progress in art and science are due. It is in them that public opinion is formed, and so organized as to act upon the administration, and, even independently of direct representation, upon the legislation of a country; and although the individual freedom enjoyed in great cities may often tend to license, its general influence in an otherwise healthy community is highly beneficial to the moral tone of the whole. It must, however, be admitted that the democratic spirit in cities is liable to be carried too far, and that an excessive growth of large towns might thus prove dangerous to the state.

Medical Statistics of Cities.—The average number of deaths in cities is higher than in rural districts, but probably no city has ever yet existed in which sanitary laws have been observed, not to say as well as they might be, but as well in one district of the city as in another. Thus the extreme difference of mortality between different districts in the same city may be quite as great as the average difference between town and country. This is a point which the accumulation of precise statistics may not yet be sufficient to determine; but it must be evident that with the best sanitary regulations the city has some advantages over the country for the preservation of health to counterbalance the undoubted advantages of the country, especially in purer air. It is much easier in the city to avoid undue exposure, and medical assistance, as well as all appliances for the preservation of health, can be commanded there more freely than in the country. Perhaps the mortality of London presents the strongest evidence that the mere living in a city is not necessarily unfavourable to longevity. Vastly as London exceeds all other cities in Europe in population, and imperfect as its sanitary arrangements in many respects are, its mortality is yet very moderate, and does not compare very unfavourably with the average mortality of the country. The mean rate of mortality in London, as shown by the returns of the registrar-general for the thirty-one years up to 1871, was 24·34 per 1000 per annum. In 1888 it was 18·7; in 1898, 19·2. The mortality is higher than the mean in the east and central districts, lower in the west and north. In the low southern districts the mortality has decreased in consequence of drainage. In 1898 the mortality of Liverpool was 23·9; Manchester, 21·4; Salford, 21·9; Birmingham, 20·4; Sheffield, 20·6; Bristol, 17·5; Newcastle, 20·8; Glasgow, 21·5; Edinburgh, 19·5; Dublin, 26·2. As regards mortality, London compares favourably with most of the larger European cities, of which St. Petersburg and Moscow have the highest death-rate (29 or 30). Cities in the U. States and Canada seem to be much on a par with those of Britain. Asiatic cities stand much higher. See MORTALITY.

CIUDAD, in geography, the Spanish word for city, from the Latin *civitas*, appears in many names of Spanish places, as Ciudad-Rodrigo, Ciudad-Real, &c.

CIUDADELA, a city and seaport, Spain, island of Minorca, on a plain at the west side of the island. It is surrounded by walls and a ditch, is entered by five gates, and possesses several spacious and paved squares, a cathedral, municipal buildings, a school, hospital, cemetery, and several convents with churches attached. The inhabitants are engaged in weaving woollen fabrics, expressing oil and wine, and in husbandry. As a port its commerce is inconsiderable. Pop. (1887), 8447.

CIUDAD-REAL, a province of Spain, occupying the south extremity of New Castile, bounded N. by the province of Toledo, E. by Albacete, S. by Cordova and Jaen, and W. by Caceres and Badajos; area, 7840 square miles. The province in general is bare-looking, immense plains stretching from the mountains of Toledo to the Sierra Morena; the central parts are sandy and barren, but north and south are lofty sierras and deep valleys, in some places clothed with forests, in others rocky and precipitous, with no other vegetation than lichen, wild-thyme, or thistles. The mountains of Ciudad-Real abound in minerals: iron, silver, copper, lead, antimony, cinnabar, and coal; also in quarries of marble, jasper, quartzite, granite, &c. From them likewise flow various streams, chiefly affluents of the Guadiana, which traverse and help to fertilize the country. Medicinal and mineral springs, both hot and cold, are abundant. The climate is dry, and in the heat of summer very oppressive; east and south winds are said often to bring destructive visitations of locusts. The plains and valleys are productive in the vicinity of the rivers, but are for the most part barren for want of moisture; in favourable seasons, however, good crops of numerous cereals are obtained. Cattle, sheep, mules, &c., are reared. Woollen, linen, and other fabrics, hardware, earthenware, esparto, &c., are manufactured; brandy, wine, and oil of good quality are made. Iron, silver, copper, and other metals; manufactured goods, brandy, wine, and oil; horses, mules, and cattle are exported. Pop. (1897), 305,002.

CIUDAD-REAL, a town of Spain, New Castile, capital of the above province, on a low plain near the Guadiana, and 100 miles south of Madrid. The walls are in many parts ruinous, and the whole town has a deserted look, the space which it occupies being larger than its population requires. The principal edifices are the church of Santa Maria del Prado, a magnificent structure consisting only of a single nave, but so grand, spacious, and lofty, that no other in Spain, except the cathedral of Coria, equals it; the hospital; the institute, with a good laboratory and botanic garden. At the north end of the town is the Puerta de Toledo, a semi-Moorish archway. The manufactures and the trade are of little importance—the former in woollen and linen cloths, the latter in grain, wheat, wine, &c. Pop. (1887), 14,702.

CIUDAD-RODRIGO, a fortified town in Spain, in Leon, on the river Agueda, about 15 miles from Portugal and 55 miles S.S.W. Salamanca. The river is here crossed by a long bridge. The town is now a poor, dull place, but there are several interesting churches, and a castle dating from the thirteenth century. The bishop of Ciudad-Rodrigo is suffragan to Valladolid. The cathedral, extending N. to S., was begun in 1190, and contains many interesting features. Ciudad-Rodrigo was a place of considerable importance in early Spanish history as a frontier fortress. It was taken by the English in 1706, during the war of the Spanish Succession, and recovered by the Spaniards in 1707. The fort, containing 6000 men, was surrendered to the French under Masséna, July 10, 1810, having been bombarded twenty-five days; and Jan. 19, 1812, it was taken by storm by the British under Wellington, after a siege of eleven days, and continued for some time to be the head-quarters of the British army. The Cortes now bestowed upon Wellington the title of Duke of Ciudad-Rodrigo, and the rank of a grandee of Spain of the first-class; and he was also created an earl by George III. Pop. (1887), 8330.

CIVET (*Viverra*, Linn.), a genus of carnivorous animals forming the type of the family Viverridæ, natives of the warmer regions of Asia and Africa. They have a long head with a sharp muzzle, a ringed tail, a whitish throat, and crest of black hair on the back; and are particularly distinguished by having a pouch or secretory apparatus in which collects a powerfully odorous matter known by the name of *civet*. In general appearance the civets remind one of animals of the cat tribe, which they also resemble in habits; but the claws are by no means so sharp as those of the cat, though they are partially retractile or cat-like. The resemblance of the civet to animals of the feline race is increased by the pupils of the eyes, which contract in a straight line; and by the colour of the fur, which most species have banded or spotted with black upon a deep-yellow or dun-coloured ground. The tongue is studded with stout horny prickles, and the ears are of moderate size, straight and rounded to their tips. The pouch, situated near the anus, is a deep bag, sometimes divided into two cavities, whence a thick, oily, and strongly musk-like fluid is poured out. The civets are nocturnal, and prey upon birds and small mammals. They may be considered as forming the transition from animals of the weasel or marten kind to the feline or cat tribe. The chief species is the African civet (*V. civetta*), and among the others are the *zibeth* or Asiatic civet (*V. zibetha*), the Tangalung (*V. tangalunga*), inhabiting Malaysia, and *V. megaspila*, a species found in Malacca and Cochin-China. *Viverricula* is a closely-allied genus including the *rasse*, of India, China, and other parts of Asia. The genets, forming the genus *Genetta*, have no scent-pouch. The odoriferous substance which these animals yield, called, from them, civet, when good, is of a clear yellowish or brown colour, and of about the consistence of butter; when undiluted the smell is powerful and even offensive, but when largely diluted with oil or other materials it becomes an agreeable perfume. It contains stearin, olein, and other substances, together with a yellow colouring matter. At a time when perfumes were more fashionable than they are at present civet was very highly esteemed, being by many even preferred to musk. Young civet-cats were purchased by the drug-dealers of Holland, England, &c., and were brought up tame for the sake of the civet, 'so that a cat which is large and gentle may come to be valued at between four and eight pounds sterling'. The medical virtues once attributed to the civet were numerous and various; but in course of time it has been entirely laid aside, even as a perfume; so that at this time the words of poor King Lear, 'Give me an ounce of civet, good apothecary, to sweeten my imagination', might be frequently repeated, even in our large cities, with slight probability of obtaining the article. In eastern countries tame civets are still kept and the perfumes highly prized. (See plate at article CARNIVORA.)

CIVIC CROWN, among the Romans, the highest military reward assigned to him who had preserved the life of a citizen in battle. It bore the inscription '*Ob civem servatum*', that is, 'for saving a citizen', and was made of oak leaves. He who was rescued offered it, at the command of his leader, to his preserver, whom he was bound to honour afterwards as a father. Under the emperors it was bestowed only by them. Various marks of honour were also connected with it. The person who received the crown wore it in the theatre, and sat next the senators. When he came in all the assembly rose up as a mark of respect. The senate granted to Augustus, as a particular mark of honour, that a civic crown should be placed on the pediment of his house, between two wreaths of laurel, as a sign that he was the constant preserver of his fellow-citizens and the conqueror of his enemies. Similar honours were also granted to the Emperor Claudius.

CIVIDALE (ancient *Forum Julii*), a town of Italy, in Venetia, in a basin of the Julian Alps, 8 miles E.N.E. of Udine. It consists of the town proper, surrounded by walls and ditches, and of fine suburbs; and has among its edifices a large cathedral of the fifteenth century, with three Gothic portals, a curious baptismal font, and several fine paintings, a museum of antiquities, and a record office, with some very ancient charters. The neighbourhood abounds in interesting antiquities. Pop. 8500.

CIVIL DEATH. See DEATH (CIVIL).

CIVILIS, Julius, the leader of the Batavi in their revolt against the Romans, 69–70 A.D. At one time he held a command in the Roman army, but being more than once charged with treason he escaped and roused the Batavians, his countrymen, to rebellion. Pretending to espouse the cause of Vespasian against Vitellius, he raised a powerful army, and inflicted severe defeats on the Romans. An imposing force sent against him he routed and shut up in the military station Vetera Castra, which after a long siege capitulated, on which all its defenders were slaughtered. Fortune at last forsook him, and he had to negotiate with the Romans, the Batavians returning to their allegiance. His fate is unknown.

CIVILIZATION. The influences by which men operate upon each other in society produce in their aggregate the particular state and tendencies of each society, and these constitute what is called the civilization of the society. Civilization, then, may be defined as the sum of the results of individual influences upon society. When these influences are upon the whole beneficial, civilization is progressive; when they are injurious, it is retrograde. The common use of the word civilization as an equivalent of progress or refinement is a sufficient indication of the belief of mankind that these influences are on the whole beneficial; and the continued existence of society is in itself a confirmation of this belief. History, however, presents us with two distinct movements in civilization, a progressive and a retrogressive one. These may be observed apart, according as the one or the other predominates. When a particular society is isolated from communication with others it has usually been found to retrograde until it has sunk to a point in the scale of civilization corresponding to the number of active influences to which it is still subjected. Thus among the various tribes of savages who have long lived in insulated situations beyond the reach of the general tide of civilization, many have been found who have shown no signs of original degradation of type, and whose low state of civilization is to be attributed exclusively to their comparative isolation. No other instance need be cited than our own ancestors, and the barbarous and semi-barbarous tribes which overthrew the Roman Empire, and now constitute the most polished nations of Europe. On the other hand, when a state is advancing by conquest, commerce, or other means, in power and influence, and is brought into continual contact with other civilizations, its own advances rapidly until it attains a high level, and the progressive movement alone is visible in it. Such was the condition in their palmy days of Greece and Rome. A mean state between these two is still to be found. When a great nation like China isolates itself from communication with others it does not escape the common law, but its mere numbers prevent it from sinking so low as a thinly sown and partially organized population. In China we have, consequently, the remarkable phenomenon of a civilization advancing, up to a certain point, in parallel lines in almost every particular with the most advanced European civilization, though without communication with it, and then stopping short, and remaining stationary for a succession of generations. Till recently Japan presented a case similar to that of China, but it is now rapidly bringing itself quite abreast of western civilization.

When all these circumstances are considered in their details it will readily be perceived that the two contrary movements which make up the actual sum of civilization do not operate independently and in distinct epochs, but are constantly at work together at the same time and in the same society, and that it is the balance of their influence only which determines the progressive, retrograde, or stationary condition of a community. This explains the endless variety and contradictory nature of the views held regarding civilization. It shows, for example, how two observers, both able and clear-sighted, looking at the same time at the same society can conclude, the one that it is progressing, the other that it is retrograding. Neither can see the whole influences to which the society is subject, and each judges from what he sees. Considering the influences to which society is subject in another light, they may be divided into two classes: stimulating influences, consisting of all these impulses, impressed upon society by the energy and originality of individual thought and action; and repressive influences, consisting of the whole power of repression exerted upon individual energy and originality by the combined action of society. Such are positive laws, habits founded on the instinct of imitation, the indolence and love of luxury promoted by wealth, the restraint of liberty resulting from dread of social censure, and innumerable other bonds increasing in stringency with the progressive complication of social organization to which society subjects the individual. These bonds are remarkably strong in modern society, and have a tendency, as they increase in strength, to produce a uniform type of individual character among all persons not possessed of unusual energy of thought or will, together with a similar sameness in social training and habits.

When we look back on the history of civilization we do not find a uniform progress among those peoples who have kept up the traditions of history and maintained an unbroken communication with the leading types of civilization in their day. The fall of the great empires formed by conquest or commerce, proceeding as it did mainly from internal causes, must be regarded as the break-down of an overstrained civilization, the culmination of retrograde influences slowly accumulating amid past prosperity. These crises have usually exercised a wide influence of an adverse kind upon the whole progress of civilization, while the highest attainments in art, science, and literature of the peoples more immediately concerned have frequently perished in them. Thus while our modern civilization has descended directly from that of Greece and Rome, and these probably from the earlier civilizations of Eastern nations, there are remains of several cycles of ancient civilizations, each of which probably remains in some respects superior to the highest attainments of after-times. But though much has been lost in these crises all has not been lost. Somewhere the vital principles of the old civilization have always been grafted on a new stock, and a new cycle of progress has commenced, in which much that has been lost has had to be slowly relearned, but in which, through the very exertions made to reacquire and rediscover what has been lost, new acquisitions are made and new paths of improvement opened up.

In the progress of civilization another thing is to be observed. It is with communities as with individuals. The full attainments of age never fulfil the promise of youth. Among the possibilities of a rising civilization there must always be many which are doomed in the course of historical development to be extinguished. This explains a phenomenon which might otherwise seem unaccountable, that the rude and comparatively barren periods in the cycles of civilization are commonly the periods of the highest flights of poetry, and that the fulness of science on the other hand seems to extinguish the light of imagination. It is that the early ages of a nation's progress are its time of promise. There is then, too, comparatively little for men of contemplative mind to dwell on in the present. They are thrown upon the future, and expend the sagacity which might otherwise have been devoted to scientific research, in prophetical anticipations clothed in allegorical vision or fable; or if the past allures them, it is with the view of stimulating those around them to emulation and higher achievement. At the other end of the cycle of progress there are the innumerable failures of an advanced civilization to account for, and poetry loses itself in endless refinements.

The question of the influence of religion on civilization is one of the highest importance, but may for the present purpose be easily disposed of. The fact is undoubted, that the religions of all peoples have at all times exercised a powerful influence upon their civilization. There can be no doubt that it is so at present, that a Mohammedan country, for example, differs widely in its civilization from a Christian one, from the mere fact of its being Mohammedan. In considering how far the influence of Christianity on our civilization has been beneficial one thing must be borne in mind—That Christianity, as we have stated elsewhere (see CHRISTIANITY), never has existed in society in a state of perfect purity. It is an exoteric influence which has operated variously at various times according to the number of active ideas it has communicated to society for the time being. Christianity still exists independently of society in its moral precepts and historical facts, and its influence in the future will doubtless continue to vary as it has done in the past. The notion that it will diminish as science advances seems to be founded on a complete misconception. Individuals and society are influenced not merely by knowledge, but by passions and desires. These are controlled by moral motives, on which scientific facts have only a very feeble and remote influence, and to which the precepts of Christianity appeal directly and powerfully. As long as a people, then, retains a belief in Christianity as a system of morals not directly derived from science, its morality will continue to be based upon its Christianity and not upon its science, and this will both directly and indirectly influence its civilization in a degree little affected by the increase of scientific knowledge. It is true, however, that science has changed and may continue, without affecting our belief in it, to change our views of Christianity, and in this way may modify without destroying or even weakening its influence.

From this outline of the conditions of the problem of civilization we shall probably be justified in leaving to our readers the many questions that may arise from speculation on its future progress. From the past it may be predicted with tolerable safety that there will be progress on the whole; that the progress will be intermitted and interrupted; and that it will never, perhaps at the best, be quite as satisfactory as it might be.

CIVIL LAW.—I. The Romans understood by this term nearly the same as in modern times is implied by the phrase *positive law*, that is, the rules of right established by any government. They contradistinguished it from natural law (*jus naturale*), by which they meant a certain natural order followed by all living beings (animals not even excepted); also from the general laws of mankind, established by the agreement of all nations and governments (*jus gentium*). In this sense, therefore, it embraced the whole system of Roman law, both the private law (*jus privatum*), which relates to the various legal relations of the different members of the state, the citizens; and the public law (*jus publicum*), that is, the rules respecting the limits, rights, obligations, &c., of the public authorities.—II. As, however, the laws of any state, particularly such a one as Rome, can rest only in part on positive and special decrees, and must always be developed, in a great measure, by the customs and religious and philosophical opinions of the nation, and the decisions of the courts, further distinctions soon grew up. The supreme administration of justice in Rome was in the hands of the prætors; and these officers, on account of the paucity of positive enactments, soon acquired the power of supplying their deficiencies. To quote the words of Gibbon—'The art of respecting the name and eluding the efficacy of the laws was improved by successive prætors; and where the end was salutary the means were frequently absurd. The secret or probable wish of the dead was suffered to prevail over the order of succession and the forms of testaments, and the claimant who was excluded from the character of heir accepted with equal pleasure, from an indulgent prætor, the possession of the goods of his late kinsman or benefactor. In the redress of private wrongs compensations and fines were substituted for the obsolete rigour of the twelve tables, time and space were annihilated by fanciful suppositions, and the plea of youth, or fraud, or violence annulled the obligation or excused the performance of an inconvenient contract. A jurisdiction thus vague and arbitrary was exposed to the most dangerous abuse. But the errors or vices of each prætor expired with his annual office; and such maxims alone as had been approved by reason and practice were copied by succeeding judges.' The prætors made an annual declaration at the commencement of their term of office of the principles according to which they intended to administer justice (*edictum prætoris*). This was publicly exposed on a table (*album*), and uniformity was maintained in the series of prætorian edicts by the legal spirit of the nation. Under the Emperor Hadrian a new publication of the prætorian edicts, unalterable from that time (*edictum perpetuum*), took place, respecting the real extent of which scholars do not agree. The whole body of rules and remedies established by the prætors, whose jurisdiction resembled in some respects that of the courts of equity of England, was called *jus honorarium*, and was opposed to the strict formal law (*jus civile*). (See the next paragraph of this article.)—III. The Roman law, in the shape which it assumed after the whole was digested in the sixth century A.D., under the Emperor Justinian, was fully and formally admitted as binding in only a small part of Italy; but both here and in other ancient portions of the empire it retained great influence, even after the Teutonic tribes had established new governments in the territories which had been under the dominion of Rome. In the south of France the collection of imperial decrees and decisions which Theodosius II. (A.D. 438) had prepared remained valid also under the Goths. After the eleventh century Upper Italy, particularly the school of Bologna, became the point where the body of the Roman law, put together by the Emperor Justinian, was formed by degrees into a system applicable to the wants of all nations. This system was introduced into almost all the countries of Europe, because the want of a well-digested body of law was seriously felt. After this model the ecclesiastical and Papal decrees were arranged, and to a considerable degree the native laws of the new Teutonic states. From all these the Roman law was distinguished under the name of *civil law*. In this sense, therefore, *civil law* means *ancient Roman law;* it is contradistinguished from *canon law* (which see) and *feudal law*, though the feudal codes of the Lombards have been received into the *corpus juris civilis*. (Respecting the present form of the collections of Roman law see the article of CORPUS JURIS.)—IV. As the Roman code exerted the greatest influence on the private law of modern Europe, the expression *civil law* is also used to embrace all the rules relating to the private rights of citizens. Under the term *civil law*, therefore, on the continent of Europe, is to be understood not only the Roman law, but also the modern private law of the various countries; for example, in Germany, *Das gemeine Deutsche Privatrecht;* in France the *Code civil des Français* or *Code Napoléon*. In this sense it is chiefly opposed to *criminal law*, particularly in reference to the administration of justice, which is to to be divided into *civil justice* and *criminal justice*. Having made these few remarks on the name and character of the civil law, we shall now proceed to a more particular account of its history.

The history of the Roman law, embracing its gradual development, its final completion under the later emperors, particularly under Justinian, and the great influence which it has exerted even down to the present period in Europe, is a most interesting and important subject. Rome may be said to have thrice conquered the world—namely, by its arms, by its laws, and by the decrees promulgated from the Papal chair. The dominion of its laws has been the best founded and the most extensive. The Roman laws may be formally abolished, but their influence can never cease. Their effect is as permanent as that of Grecian art. At the same time it is not to be denied that the introduction of the civil law has in the case of several nations obstructed the development of their own peculiar systems of law, and in this respect produced evil consequences; but such is the nature of great agents which are beyond the control of human power. An acquaintance with a more perfect language, a more beautiful style of art, though we can hardly say with a purer religion, has likewise prevented the growth or completion of many institutions and modes of action which might have borne noble fruits. In considering the history of the civil law, as, in fact, of any system of law which has sprung from the wants of the people among whom it grew up, we must take into view the public law and political history of the state, and the growth of its civilization. The commencement of the history of Rome offers little that is original. Its institutions were such as existed in all the neighbouring states. Greek views predominated throughout. The royal authority fell in Rome, as it had fallen in all the Greek governments, and the division of the nation into a hereditary body of nobles, and a comparatively powerless community of citizens, gave rise to numerous and lasting struggles. If manly firmness (*virtus*) constituted the *beau ideal* of a genuine Roman, the same quality was the basis of the Roman laws. These laws did not consider the individual principally in his connection with others, like the ancient German laws, which give a value to the individual chiefly as a member of a family or a community, but at an early period treated every one as an independent member of society, the head of a family, free from the restraints of relationship, or membership of corporations. Institutions like those of the Germans, recognizing a property common to a family or a corporation, hereditary or entailed, a body of attendants attached to the lord, feudal services, unequal right of inheritance among children, &c., are not to be found in the civil law. The relation between patricians and plebeians, between patrons and clients, was very different from the feudal connection. The expulsion of the kings was at first of advantage only to the higher classes of citizens (B.C. 509), but only fifteen years afterwards (B.C. 494) these were obliged to grant to the other citizens the college of the tribunes and the right of holding deliberative assemblies, which opened the way for the great compact of the twelve tables, drawn up by patrician decemvirs (B.C. 451–50), which the ancients considered as establishing equality of rights, though it was not till some years afterwards that the patricians and plebeians were allowed to conclude valid marriages with each other (*lex Canuleia*, B.C. 445); and not till a much later period were plebeians capable of being elected consuls (B.C. 366). An important point of that fundamental law or charter, if we may give it a modern name, was the establishment of such an order of legal procedure that the poorer class of citizens, and particularly those living without the city, should not, as had been too often the case, suffer from their causes being hurried through the courts. Another important point was the settlement of the legal independence of the individual. Eighty years after the plebeians had been made capable of being elected to the consulship the senate was obliged to acknowledge the validity of the people's decrees (*plebis-scita*) by the *lex Hortensia* (B.C. 287); and from the first appointment of a *prætor urbanus* (B.C. 366) it was customary, as we have already said, for this officer to give public notice annually, at the beginning of his term of office, of the principles according to which he intended to decide the cases that should fall within its jurisdiction. These edicts of the prætors, in which the same rules, with few exceptions, were uniformly adopted, were a better means of keeping the system of laws in a constant state of development than special decrees would have been. By this means there grew up, besides the positive law (*jus civile*, in the stricter sense of the word), a whole body of acknowledged principles, a common law (*jus honorarium*), which supplied the chasms of the positive ordinances, mitigated their severity, or paved the way for the necessary reforms. Though the ancients, for example, Cicero, mention the great accumulation of these positive laws, yet their number, at least as far as respected private rights, appears very small compared with the laws of modern times. It was only as it regarded the regulation of public relations that there existed in the time of the republic such a mass of laws that Cæsar thought it a meritorious work to bring them into a system. But it ought not to be forgotten that the necessity which existed at that time of impressing the whole body of decisions on the memory of the lawyer made the mass become troublesome much sooner than it would if there had been collections of laws, abridgments, digests, registers, &c. For the purpose of making legislative enactments there existed in the republic two concurrent authorities—the meeting of the citizens (*plebs*, under the tribunes, *in comitiis tributis*, whose resolutions are called *plebis-scita*), and the senate (whose decrees are called *senatus consulta*). In the beginning the provinces of the two were so separated, that each one passed decrees only upon its own affairs and relations; but very soon it became necessary to acknowledge mutually a common authority (*lex Hortensia*). However, as long as Rome remained a republic, the interference of the senate in the enactment of laws was comparatively rare. After the great internal convulsions had broken out, the conquerors endeavoured to establish their authority more firmly, and to gain the favour of the people by making important reforms in the laws, particularly those which concerned the punishment of crimes and political offences, the regulation of legal processes, and some abuses in the public administration. This was done by Sylla (*leges Corneliæ*, B.C. 67), by Julius Cæsar, but much more by Augustus, in whom, from B.C. 32, the power of all the branches of government and the direction of the senate and of the meetings of citizens were united (*leges Juliæ*, passed chiefly under the authority of Julius Cæsar and Augustus). To the laws, strictly so called, previously customary (the *leges*, approved by the citizens), and the decrees of the senate, now were added the special ordinances (*constitutiones*) of the emperors, besides which the prætors in Rome and in the provinces still retained the right of contributing by their edicts to the development of the legal system. As soon, however, as the monarchical government became settled, the forms of the republic gradually disappeared. In the reign of Tiberius (A.D. 14–37) no *leges* are to be found after the year A.D. 24, and, 200 years later, the *senatus consulta* also merged entirely in the imperial decrees, constitutions, and rescripts. The annual edicts of the prætors, till then customary, were collected under Hadrian (A.D. 131), by the jurisconsult Salvius Julianus, into a form which was made unchangeable, called the *edictum perpetuum*. It is worthy of remark that though, after Augustus, the most absolute despotism had become established in all public relations, and the penal laws had been made mere instruments of despotism, this very time is the most brilliant period of the scientific development of the civil law. This period begins with Augustus, but the brightest part of it falls under the Antonines (from A.D. 130 until A.D. 180), and one or two succeeding emperors. The great names of Gaius, Papinian, Ulpian, Paulus, belong to this last period. When the political privileges of the citizen had no guarantee but the good disposition of the emperors, which often proved a very imperfect security, the laws which regulated the relative rights of individuals, and protected them from mutual wrong, were continually approaching perfection. This subject deserves a more thorough investigation than it has yet received. All legal relations were expressed with admirable skill and consistency in distinct definitions, and the whole system was developed from a few principles, which run through the whole, and the distinctness and simplicity of which are proved by the adoption of the Roman law among so many different nations. The process of development was in so far historical, as it was always connected with an adherence to the old forms; but it was entirely philosophical and rational, as it always strove to find out the real principles of rights and obligations, and to make the formal law dependent upon them. After the age of the Antonines (from A.D. 180), such a political confusion took place that the scientific spirit was lost. The judicial system was now continued only by the imperial constitutions, which treated but rarely of private law, while they entered much and often into the subject of public relations. The opinions of the ancient jurisconsults of the better period were regarded almost as legal authorities, and, to remedy the difficulties arising from their different views, it was provided by Valentinian III. (A.D. 426) that the majority of opinions should decide. The number of the constitutions became such that collections of them were made, first by private persons (Codex Gregorianus et Hermogenianus, about A.D. 365), then an official one by Theodosius II. (Codex Theodosianus, A.D. 438), in sixteen books, of which the last eleven have been preserved entire; of the first five, however, only fragments are extant. There was also an abridgment of this code, made in 506 for the use of the Visigoths (the Breviarium Alaricianum). Far the greater part of these decrees relates to the public law. Injurious consequences necessarily resulted from the cessation in the development of the Roman law after the time of the Antonines. It may be seen, from the expressions of Justinian, into what subtleties, what verbal and formal niceties, the lawyers had fallen in his time—a state of things in some respects not unlike the present state of law in England, from similar reasons. The public administration, at least as far as regarded its external form, had been reduced into tolerable order since the time of Diocletian and Constantine. Theodosius II. (408–450) had conceived the idea of arranging the immense mass of rules and authorities relating to the private law, but the difficulties on examination were considered too great, and no sovereign till Justinian (527–565) had the courage to meet them. He first ordered the imperial constitutions, which still remained in force, to be put into a new collection (Codex Justinianus, commenced in 527), and decided, in and after the year 530, fifty legal questions which had been till then left doubtful. At the same time, a systematic abridgment of the writings of the jurisconsults was made by seventeen commissioners, embracing fifty books of *digests* or *pandects*, and an introduction to the study of jurisprudence was prepared (*institutiones*): both works were published December 30, 533, and invested with legal authority. In the following year a new collection of imperial decrees (Codex Repitatæ Prælectionis), in twelve books, was published, and from that time another series of single decrees (thirteen edicts and 159 *novellæ constitutiones*), by which the Roman law may be considered as completed, because it was deprived of its capacity of further development, and left to mankind as a rich but lifeless treasure. The opinions respecting this work of Justinian are very various. If we consider merely the practical utility of his labours, as regards his age and people, it will not be denied that he conferred a great benefit on his subjects, and the changes themselves, which were made in the existing regulations, proceeded mostly from a sound view of the higher objects of the law. The abolition of antiquated and useless forms, the simplification of legal relations and legal processes, must be acknowledged to have been the principal objects of the changes made; and these changes were executed with judgment. If there are decrees of little value among them, these imperfections are not greater than we find in all ancient and modern codes. Our limits will not allow us to mention here the different editions, abridgments, and translations of the work prepared for the Greek provinces (the Western provinces were soon lost for ever). One Greek edition of a much later date was ordered by L. Basilius Macedo (867–886), and executed under his successor, Leo the Philosopher (886–912). This was called Libri Basilicorum, or the Basilica (which see). The downfal of the Roman Empire did not destroy the Roman law, but in some respects has enlarged its dominion. It was in force before the modern governments were established throughout the Roman Empire in Europe, and when the Goths, Franks, Lombards, Burgundians, and other Teutonic tribes erected new empires, not only a large part of the public law of Rome was incorporated into the new constitutions, but the private law also continued to be acknowledged as valid among the old inhabitants. The new rulers took care that, besides their different ordinances for the weal of the Germanic tribes, abridgments and modifications of the Roman law should be made, sometimes, it is true, rude and barbarous enough. Among these were the Breviarium Alaricianum of the Visigoths, 506; the Lex Romana of the Burgundians, or Papiani Responsa, between 517 and 534. For the Lombards a *rifacimento* of the Roman law was prepared in the eighth and ninth centuries, and thus in the south of France and Italy this law continued in authority uninterruptedly, as far as it was adapted to the new state of things. But this authority, of course, diminished in proportion as new forms of family relations and social connections and new species and tenures of property sprang up, particularly under the feudal system, and in proportion as the internal disturbances in the different states unsettled the idea of law in general. But this idea was awakened again after the states had gained a degree of stability. People began to perceive that there was a nobler and firmer basis of right than mere power; national union gained consistency and true value by means of commerce and industry; the lower classes demanded the extension of their privileges; the increasing activity produced more solid distinctions than those of birth; the insufficiency of the old laws began to be felt, and the blessings of a scientific cultivation began to be diffused, borrowed, in a considerable degree, from the Arabians in Spain. In this state of things men rose, in Upper Italy, in the eleventh century, who freed the law books of Justinian from the obscurity in which they had been buried till then, and by these means gave a new impulse to the science of law. Irnerius, towards the end of the eleventh and in the twelfth century, is mentioned as the first of them. All the nations on the European continent seized eagerly upon the treasure offered to them, after the model of which were now digested the Papal decrees, the feudal law, and at a later period the Germanic laws. Thousands of scholars, from all parts of Europe, went to Bologna and other cities of Italy to study law there. It was generally supposed at first that the Roman law was applicable to the whole of Christendom; but it was soon found out that there existed whole systems of laws and legal relations with which the rules of the civil law would not harmonize; and the peculiarities in the organization of the tribunals of different countries were long an obstacle to the formal adoption of the civil law. This adoption, therefore, did not take place in the various countries at the same time, nor to the same extent. In Italy and the south of France it was introduced first and most completely; at a later period, and to a less degree, in the north of France (in the *pays de droit coutumier*), where it has never, in fact, been acknowledged as binding, but only as an authority in regard to general principles of natural law (*raison écrite*), and still retains this degree of influence, notwithstanding the establishment of the *Code civil*. In England it never has been received in the ordinary civil courts (it is, to some extent, in Scotland), but the spiritual courts have always been guided by it. It is, therefore, in force in such cases as fall under the jurisdiction of these courts, for example, such as relate to last wills. It is also in force in the admiralty courts, but in both with many modifications. In Germany the idea that the emperors were the successors of the Roman sovereigns contributed much to obtain legal authority for the Roman law in that country; and this has been confirmed by several laws of the empire and of the different states composing it. But the native laws have everywhere prior authority, and the Roman law can only be applied in cases where these make no provision; but all those of its rules which relate to institutions confined to Rome have no force. It is not allowed, moreover, to be applied to cases growing out of modern institutions, such as fiefs, primogeniture, bills of exchange, nor in questions belonging to the public law. Many cases, therefore, can happen in which there may be much doubt whether the Roman law is applicable or not. Prussia and Austria have codes; but in other German states, as in Saxony, there is a great confusion between the Roman and the native law. We have already observed that the effects of the Roman law never would cease, and its influence is perceivable in all the modern codes. We would not be understood as intimating an opinion that the Roman law supersedes the necessity of forming new codes. These are desirable in many nations on many accounts, and among others, because the Justinian code itself is not without obscurities, and the language in which it is written renders it inaccessible to the bulk of the people of every modern state. Whether the principles of the Justinian code agree or not with those of the English law, it must be of great advantage to the common lawyer to study a digest which contains the recorded wisdom of many centuries, and furnishes abundantly both examples and warnings. See Amos's History and Principles of the Civil Law; Ortolan's History of Roman Law; Savigny's Roman Law in the Middle Ages.

CIVIL LIST formerly signified the whole expenses of the government, with the exception of those of the army, navy, and other military departments. It is now limited to the expenses proper to the maintenance of the household of the sovereign. It was once a principle in England, as in other Teutonic nations, that the monarch was to pay all the expenses of government, even including those of the army, from the possessions of the crown, the domains (in German *Fürstengüter*), and that the subjects were not obliged to contribute anything more than they voluntarily engaged to. From this principle, which is proved by the history of the origin of the domains, it appears that the crown lands in general cannot be considered the private property of the ruling family. On the contrary, they are, in general, the property of the state, and have been given to the prince to defray the expenses of government. The crown lands of the Saxon kings were very considerable. After the Norman conquest they were much increased by confiscation, but were soon diminished by grants. Under Henry VIII. they were again much increased by the secularization of the convents, but the greater part of the possessions of the religious orders was squandered by this prince. William III. thought it necessary to strengthen his government by liberally rewarding his most faithful adherents, for which reason he made grants of the crown lands with such profusion that, under the government of his successor (in 1702) a law was passed prohibiting the alienation of the royal domains. There exist few crown lands at present, and the income from them goes into the public treasury. Until the Restoration the whole expenses of the government continued to be defrayed out of the royal revenue. The first Parliament of Charles II. fixed on £1,200,000 as the ordinary revenue of the crown in time of peace. For this they provided by taxation, which ultimately produced more than the amount of the grant. The same taxes were continued during the reign of James, and produced on average £1,500,000, besides which he received extraordinary grants. At the commencement of the reign of William the Commons made still further restriction on the royal control of the revenue. They voted £1,200,000 as the revenue of the crown in time of peace, one-half of which was appropriated to the maintenance of the king's government and the royal family, the other to public and contingent expenditure. The outbreak of war prevented this arrangement from being exactly carried out, but the Commons maintained the principle of separating the regular and domestic expenses of the king from the public expenditure, and establishing a systematic and periodical control over the latter. The amount actually voted to the king for life in 1697 was £700,000, and the same vote was made at the commencement of the reign of Queen Anne and George I. By the beginning of the reign of George II. the revenue appropriated to the civil list was found to have produced £830,000, and this sum was voted on the accession of George II. Besides the regular vote, grants had been frequently made to defray debts incurred in the expenditure of the sovereign. Queen Anne, indeed, devoted £100,000 of the civil list as a contribution to the war expenditure, but in the reign of George I. the regular revenue was often exceeded. On the accession of George III. the civil list was fixed at £800,000, but instead of being paid out of appropriated revenues in which the crown lands were included, these were surrendered, and it was charged on the ordinary taxation. Large extra grants had to be made during this reign. At the commencement of the reign of Victoria a civil list of £385,000 per annum was settled on her majesty for life for the support of her majesty's household, and the maintenance of the dignity of the crown, £60,000 being allotted to the privy purse. In 1901 the civil list of King Edward VII. was raised to £470,000, £110,000 of this being for the privy purse. Many Continental states have a fixed civil list; that of Russia is £1,410,000; of Turkey, £920,000; of Austria, £730,000; of Prussia, £900,000.

CIVIL SERVICE. The civil service includes all offices under government, except those directly connected with the army and navy. In Great Britain it comprises various departments, such as the Home Office, the Foreign Office, the War Office, Admiralty, Post-office, Customs, Excise, &c. Formerly, appointments to the civil service in Great Britain were in the gift of the executive government, and were obtained by influence, while the bestowal of them was used as a means of gaining parliamentary support on behalf of the government. Those appointed were not called upon to show whether they were competent or not, unless certain heads of departments chose to require proof of this. By an order in council of 21st May, 1855, examinations were instituted to test the efficiency of all candidates for subordinate posts; but for some time candidates required to be specially nominated for those posts. As more than one might be nominated for a post, competition was gradually introduced, and in 1870, by a further order in council, it was directed that appointments in the civil service should (with certain exceptions) be filled by open competition, as was already the case with appointments in the Indian civil service. The examining commissioners are required to ascertain—1. That the candidate is within the limits of age prescribed in the department to which he desires to be admitted; 2. That he is free from any physical defect or disease which would be likely to interfere with the proper discharge of his duties; 3. That his character is such as to qualify him for public employment; 4. That he possesses the requisite knowledge and ability for the proper discharge of his official duties. The appointments to what are known as *clerkships* in the civil service are divided into two classes or divisions, the limits of age for the higher being 22 to 24, and for the lower 17 to 20. The salary of clerks in the lower division regularly begins at £70 and may rise to £250, with £100 additional for proved efficiency. In the higher division, while the examinations are more severe, the salaries are much better, the commencing salary ranging from £100 to £250 and the maximum attainable being as high as £1000. The two divisions are kept quite distinct and it is rare for a person to be promoted from the lower to the higher. For a number of appointments open to competition special qualifications, scientific or technical, are necessary, while there is also a special limit of age. A person may be appointed without preliminary examination in the event of any appointment requiring a person of mature age possessed of special qualifications. A large number of subordinate appointments in the postal and telegraph service, the excise, &c., are on a different footing from the clerkships just mentioned, and are not so well paid. Women are now largely employed as telegraphists, clerks, letter-sorters, &c. Boy clerks are also employed. The Indian civil service, for which examinations are held in Britain, is a branch by itself. By applying to the Secretary to the Civil Service Commission, Westminster, full information may be obtained regarding appointments in the civil service, the subjects of examination, the limits of age, the fees payable by competitors, &c.

By the act 22 Vict. cap. xxvi. superannuation allowances to the civil servants of the crown are regulated. It provides that all persons who shall serve in an established capacity in the permanent civil service of the state, whether their remuneration be computed by day-pay, weekly wages, or annual salary, who are not specially excepted or otherwise provided for by act of Parliament, shall receive superannuation allowances on the following scale: for ten and under eleven years' service, ten-sixtieths of the annual salary and emoluments of their office, with an additional sixtieth for each years' additional service until the completion of forty years, when no further addition to the retiring allowance is to be made. The servants occasionally engaged in the state departments called 'writers', are treated as supernumeraries, and are not considered as being on the permanent staff of the civil service. In the *Civil Service Estimates* of Britain are included all the expenditure not incurred by the support of the army and navy, such as that required for education, law and justice, public works, &c., besides the salaries of those in the various public departments. The total expenditure is usually about £18,000,000 annually.—In the United States civil service the system still obtains by which the party in power confers the various appointments on such of its members as have most influence or have done it most service, there being thus a great change of officials with each change of president. Some attempts to establish a better system have recently been made, but with little success.

CIVITA-DI-PENNE (ancient *Pinna-Vestina*), a town of Italy, in the province of Teramo, Naples, built on two hills, 29 miles E. by N. of Aquila. It was formerly a place of importance. The Normans, under Roger I., made it the capital of their kingdom. Pop. 5076.

CIVITA VECCHIA (anciently *Centum Cellæ*), a seaport of Italy, lying in a barren and unhealthy district, 38 miles N.W. Rome, with which it is connected by a good road and a railway. The port is one of the best in Central Italy. Civita Vecchia has a fortress, begun in 1512 by Julius II., from designs by Michael Angelo. It was occupied by the French from 1849 to 1870. Pop. 12,000.

CLACKMANNAN, the smallest county of Scotland, being only about 9 miles in length, 7 in breadth, and comprising an area of about 35,160 acres or 55 square miles. By the recent readjustment of county and parish boundaries the parish of Alva, formerly a detached portion of Stirlingshire, was added to the county, increasing its area by over 5000 acres. It lies on the north side of the Forth, by which it is bounded S.W. On all the other sides it is inclosed by the counties of Perth, Fife, and Stirling. The north part of the county is occupied by the Ochil Hills, but the other portions are comparatively level, and in general are exceedingly fertile, yielding large crops of oats, barley, wheat, and beans, turnips, and other green crops. The minerals are valuable, especially coal, which abounds. There are ironworks, breweries and distilleries, woollen manufactures, tanning, glass-works, &c. The principal towns are Alloa (the largest), Alva, Tillicoultry, Dollar, and Clackmannan; the last is nominally the county town; pop. (1891), 1779. It is rather poorly built, but has an interesting old tower and an old market-cross. Pop. in 1881, 25,680; in 1891, 28,488, but including Alva, 33,140; in 1901, 32,019.

CLACKTON-ON-SEA, a rising watering-place of England, on the coast of Essex, 15 miles S.E. of Colchester, with admirable facilities for sea-bathing, and of easy access from London both by railway and steamboat. It stands on cliffs over 40 feet high, and has a town-hall, a church (St. Paul's) in the early English style; a convenient pier; &c. Pop. in 1891, 3584; in 1901, 7453.

CLAIRAUT, Alexis Claude, a celebrated mathematician, born at Paris in 1713, was carefully educated by his father, whose mathematical acquirements well fitted him for the task. In his eleventh year he composed a treatise on the four curves of the third order, which he had discovered. This work, followed by the admirable Recherches sur les Courbes à double Courbure, 1731, procured him a seat in the Academy when only in his eighteenth year. He accompanied Maupertuis to Lapland, to assist in measuring an arc of the meridian, and obtained the materials of which he afterwards made such excellent use in his work Figure de la Terre. In 1740, while many clung to the hypothetical vortices of Descartes, he came forward and maintained the honour of the Academy by boldly rejecting them. In 1752 he published his Théorie de la Lune, and after a series of laborious calculations, predicted the reappearance of Halley's comet in April, 1759, but became involved in a long and keen discussion with D'Alembert, occasioned by the publication of a work by the latter entitled Théorie des Mouvemens des Comètes. He died in 1765. His Élémens de Géométrie, and his Élémens d'Algèbre, which he composed for his pupil the Marquise du Châtelet, are still regarded as models of perspicuity and elegance. Clairaut, though one of a family of twenty-one children, was survived only by a sister, on whom, in consideration of his merit, a pension was bestowed after his death. A brother, who died at the age of twelve, was, like himself, and in the same department, a striking instance of precocious intellect, having in his ninth year published a treatise entitled Diverses Quadratures Circulaires Elliptiques (Paris, 1731).

CLAIRVAUX, a hamlet, France, department of Aube, 33 miles S.E. of Troyes, celebrated for its abbey, which was founded in 1114 or 1115, by St. Bernard, but suppressed at the revolution. It was one of the most magnificent monastic establishments in the kingdom, and consisted of numerous splendid edifices inclosed by a wall considerably above a mile in circuit. The existing buildings have been converted into an immense house of correction.

CLAIRVOYANCE. See Magnetism (Animal).

CLAMECY, a town of France, department Nièvre, 38 miles N.N.E. Nevers, left bank Yonne, at the mouth of the Beuvron. It was formerly surrounded by enormous walls, and defended by a castle, which commanded the town and environs. One of its suburbs, situate on the opposite side of the Yonne, was the seat of a bishopric *in partibus*, known as the bishopric of Bethlehem, founded in 1180 for the bishop of that place, who had been expelled by the Saracens. Wood-rafts for the supply of Paris with fire-wood are made up here, and floated down the Yonne and Seine. The parish church, founded in 1497, is remarkable for its tower and for some fine sculptures. Clamecy carries on several industries, the chief being that of tanning. Pop. (1896), 4792.

CLAN (Gaelic, a tribe or family), among the Highlanders of Scotland, consisted of the common descendants of the same progenitor, under the patriarchal control of a chief, who represented the common ancestor. The name of the clan was frequently formed of that of the original progenitor with the prefix *mac* (son): thus the MacDonalds were the sons of Donald, and every individual of this name was considered a descendant of the founder of the clan, and a brother of every one of its members. The chief exercised his authority by right of primogeniture, as the father of his clan: the clansmen revered and served the chief with the blind devotion of children. The appellation of the chiefs had generally a reference to the history of their ancestors, and denoted little more than that they were the descendants of the first father of the clan; thus the chief of the MacDonalds was *Mac Allister More* (the son of the great Allister). They were distinguished from the rest of the clan by a feather in their bonnets. Each clan was divided into two orders, the *tenants* or *tacksmen*, the near relations of the chief, to whom portions of land were assigned, during pleasure or on short leases, and whose descendants were generally merged in the second class, or *commoners*, by the resumption of the land. The tacksman usually had a subdivision of the clan under him, of which he was chieftain, subject, however, to the general head of the sept. The jurisdiction of the chiefs was not very accurately defined, but, as is generally the case in such a state of society, it was necessary to consult, in some measure, the opinions of the most influential clansmen, and the general wishes of the whole body, The term clan was sometimes employed, though not with strict accuracy, to designate the associations of border freebooters. Both the Highlanders and the Borderers were very troublesome to the government of Scotland and the peaceable inhabitants of the lowlands. Hence they came often to be classed together in acts of Parliament and proclamations, and the common designation of the one might thus for convenience be transferred to the other. It was the policy of the government in Scotland to oblige the clans to find a representative of rank to become security at court for their good behaviour; the clans who could not procure a suitable representative, or who were unwilling to do so, were called broken clans, and existed in a sort of outlawry. The most notable instance of a proscribed and persecuted clan was that of the clan MacGregor, one of the most ancient clans of Scotland, who, continuing to hold their lands by the *coir a glaive*, or right of the sword, were denounced to the government by powerful neighbours who coveted their possessions, and continued during a long and bloody struggle to live in a state of outlawry. (See the introduction to Sir Walter Scott's Rob Roy.) The rebellions of 1715 and 1745 induced the English government to break up the connection which subsisted between the chiefs and the clansmen. The hereditary jurisdiction of the chiefs was therefore abolished, the people disarmed, and even compelled to relinquish their national dress. See Highlands of Scotland.

CLAPHAM. See London.

CLAPPERTON, Hugh, the African traveller, was born in Annan, Dumfriesshire, in 1788. After some elementary instruction in practical mathematics, he was bound apprentice, at the age of thirteen, to the owner of a vessel trading between Liverpool and North America, in which he made several voyages. He was then impressed into the king's service, was soon after made a midshipman, served on the American lakes in the year 1815, and in 1816 received the commission of lieutenant. Having retired to Scotland he became acquainted with Dr. Oudney, who was about to embark for Africa, and requested permission to accompany him. Lieutenant (afterwards Colonel) Denham having volunteered his services, and it being intended that researches should be made to the east and west from Bornu, where Oudney was to reside as British consul, his name was added to the expedition by Lord Bathurst. In the Recent Discoveries in Africa, made in 1823 and 1824 by Major Denham, Captain Clapperton, and Dr. Oudney (London, 1826), we have accounts of an excursion from Mourzouk to Ghraat, a town of the Tuarigs, by Dr. Oudney; of a journey across the desert to Bornu, of various expeditions to the southward and eastward, by Major Denham; and of an excursion through Soudan to the capital of the Fellatahs, by Captain Clapperton. Dr. Oudney died on the journey, and Clapperton returned to England with Denham in 1825. The geographical information collected was valuable, although it left undecided the disputed question of the course and termination of the Niger. On his return to England Clapperton received the rank of captain, and with a view if possible to solve this question, immediately engaged in a second expedition, to start from the Bight of Benin. Leaving Badagry, Dec. 7, 1825, he pursued a north-easterly direction, with the intention of reaching Soccatoo and Bornu. Two of his companions, Captain Pearce and Dr. Morrison, perished a short time after leaving the coast, and Clapperton pursued his way, accompanied by his faithful servant Lander. At Katunga he was within 30 miles of the Quorra or Niger, but was not permitted to visit it. Continuing his journey north, he reached Kano, and then proceeded westward to Soccatoo, the residence of the Sultan Bello. Bello refused to allow him to proceed to Bornu, and detained him a long time in his capital. This conduct appears to have arisen from the war then existing between Bello and the Sheik of Bornu, and to the intrigues of the Pasha of Tripoli, who had insinuated that the British meditated the conquest of Africa, as they had already conquered India. This disappointment preyed upon Clapperton's mind, and he died, April 13, 1827, at Chungary, a village 4 miles from Soccatoo, of dysentery. Clapperton was the first European who traversed the whole of Central Africa from the Bight of Benin to the Mediterranean. (Journal of a Second Expedition into the Interior of Africa, &c., London, 1829. Records of Clapperton's Last Expedition to Africa, by Richard Lander, London, 1830.)

CLAQUEURS, the name given in Paris to a company of persons paid for applauding theatrical performances, more especially on the production of any new piece. They are said to be less influential than formerly, but at one time they constituted a powerful body, whose favour it was the interest equally of authors and players to conciliate. They are divided into various classes, as *tapageurs*, who applaud indiscriminately; *rieurs*, who can laugh at the most insipid jests; and *pleureurs*, who have always tears and moans at command for whatever is intended to be pathetic. The claqueurs are sometimes called *chevaliers-du-lustre*, from mustering in greatest force near the centre of the pit, below the chandelier. They are also spoken of collectively as the *claque*.

CLARE, a maritime county of Ireland, province of Munster (capital, Ennis); boundaries, N. and E., Galway Bay and county; E. and S., the Shannon, separating it from Tipperary, Limerick, and Kerry; W., the Atlantic. The total area of the county is 827,994 acres, of which about one-sixth is under tillage, about 460,000 acres are in pasture, 150,000 are bog, mountain, and waste, some 7000 are in plantations, and about 68,000 are water. The chief crops are oats and potatoes. The surface is irregular, rising in many places into mountains of considerable elevation, particularly in the E., W., and N.W. districts. The grazing lands are excellent. The chief minerals are limestone, lead, and slate, but they are little worked, and the produce of the county is almost wholly agricultural. Lakes are numerous, but generally of small size, and the county is deficient in wood. The condition of the smaller cottiers is extremely bad, being in no respect better than in other parts of Ireland. The salmon fishery is extensively carried on in Clonderalaw Bay, in the rivers Shannon and Fergus, and at Dunbeg. There are immense oyster-beds near Ballyvaughan and along the shores of Burren. The county returned three members to Parliament previous to 1885, when it lost one of them. Pop. in 1881, 141,457; in 1901, 112,129.

CLARE COLLEGE, CAMBRIDGE, a college founded in 1326 by Elizabeth, sister of the Earl of Clare, and consisting of a master, 8 senior, and 7 junior fellows, besides scholars and students. The 15 fellowships are open to B.A.'s or persons of a higher degree, without restriction as to marriage. A fellowship becomes vacant in five years and eleven months from the time of election, unless the holder occupies at the same time the post of professor, public orator, &c., in the university, or the post of tutor, dean, bursar, or lecturer in the college. The master and fellows elect to the vacant fellowships, and the master is elected by the fellows. The foundation scholarships are eight of not less than £60, eight of not less than £40, eight of £20, four of £50 per annum each; three of about £60 per an., tenable for three years, with preference to clergymen's sons; with several minor scholarships, &c.

CLARENCE, GEORGE, DUKE OF, chiefly celebrated for his tragical end, and for the use made of his name and history by Shakspeare, was the son of Richard, duke of York, and brother of Edward IV., king of England. On his brother's accession to the crown in 1461 he was, as the reward of his assistance, created Duke of Clarence, and in 1462, Lord-lieutenant of Ireland. When the Earl of Warwick became disaffected and deserted the cause of Edward, Clarence entered into alliance with him, married his daughter in 1469, retired with him to France, and afterwards landed with him at Dartmouth on 13th September, 1470, and in a parliament held at Westminster by the Lancastrians had the crown settled on him, failing the issue of Henry VI. From a story told by Commines, it would appear likely, however that Clarence had already meditated a double treachery before leaving France, and at Coventry, on 30th March, 1471, he left the party he had espoused on the field of an imminent battle, and joined his brother Edward. Clarence was afterwards involved in a quarrel with his brother Richard, who had married Warwick's younger daughter, about the inheritance of their father-in-law, which ended in their stripping Warwick's widow, who had brought the bulk of the property into the family, of all she possessed, and leaving her in destitution. Clarence's wife having died in 1476, he offered himself, on the death of Charles the Bold, to Mary, heiress of the estates of Burgundy, but the king opposed his suit, which hardly needed his opposition to cause it to miscarry. Some of his servants were about the same time hurriedly put to death on an accusation of magic. Clarence, who had for some time engaged in a rash opposition to the court, now appeared in the council to complain of the injustice of their sentence. For this, which was called an interference with justice, he was committed to the Tower. A Parliament was summoned, which condemned him to death; and on the 18th February, 1478, he was found dead in the Tower. Of the manner of his death, or by whom it was perpetrated, nothing is known. Suspicion fell on his brother Richard, duke of Gloucester, on account of their old enmity.

CLARENDON, CONSTITUTIONS OF, a code of laws adopted in the tenth year of Henry II. (1164), at a council of prelates and barons held at the village of Clarendon, in Wiltshire, in January of the above year. These laws, which were finally digested into sixteen articles, were brought forward by the king as 'the ancient customs of the realm,' and were enacted as such by the council. They consisted, however, partly at least, of reforms introduced by the king himself. Ten of the articles were condemned, and six allowed by Pope Alexander III. The six articles approved of were of comparatively slight importance, mostly confirming the privileges of the ecclesiastical order; among the condemned articles the most important were the 1st, which provided that disputes between laymen and ecclesiastics as to advowsons should be tried in the king's court; 3d, that ecclesiastics accused of any offence against justice should be answerable to the civil courts for the civil offence, and to the ecclesiastical courts for the ecclesiastical offence; 4th, that ecclesiastical dignitaries should not go out of the kingdom without the king's leave; 8th, that appeals should be made from the court of the archbishop to the king's court, and should not go further (that is, to the pope) without the king's consent; 9th, that in the event of a dispute between a layman and an ecclesiastic as to whether the civil or ecclesiastical court should have jurisdiction in certain cases of tenure of property, the tribunal should be determined by the king's chief justice upon a recognition of twelve lawful men; 12th, that pleas of debt should belong to the king's jurisdiction. Notwithstanding the entreaties of the other prelates, and in defiance of the rage of the king, Becket, after a momentary appearance of yielding, peremptorily refused his signature to the articles. After the murder of the archbishop, the king, on his reconciliation with the pope in 1172, was compelled to promise the abolition of all laws and customs hostile to the clergy; and at the council of Northampton in 1176 the constitutions of Clarendon were materially modified in favour of the ecclesiastical order.

CLARENDON, EDWARD HYDE, EARL OF, Lord High-chancellor of England, was the third son of Henry Hyde, of Dinton, in Wiltshire, where he was born on the 18th of February, 1608. He was first instructed by the clergyman of the parish, and entered at Magdalen College, Oxford, in 1621. On the death of his two elder brothers, Edward, who had been intended for the church, was entered as a student at the Middle Temple under the auspices of his uncle, Nicholas Hyde, who was treasurer of that body. He married, in 1629, the daughter of Sir George Ayliffe of Gretenham, Wiltshire, to whom he was much attached, but she died six months after their marriage; and in 1632 he took as his second wife Frances, daughter of Sir Thomas Aylesbury. He commenced his political career in 1640, when he was returned to Parliament by the constituencies of Shaftesbury and Wootton-Basset, and elected to serve the latter. In this Parliament he argued in favour of a grant to the king, which was successfully opposed by Hampden. He was returned to the Long Parliament (November, 1640) by the borough of Saltash, and laid aside his legal business to devote himself to his parliamentary duties. At first he acted with the more moderate of the popular party, but he soon found reason to change his course. A dread of democracy seems first to have led him to oppose his former friends, but his speeches and votes soon attracted the notice of the court, into the favour of which he passed. He was offered the solicitor-generalship, which he declined, but agreed, at the king's request, to consult with his regular advisers, Falkland and Colepepper. Hyde was an honest and independent supporter of the royal authority, disposed to make moderate concessions to the popular demands, and was in no way responsible for the rash measures of the king, which were often taken without consulting any of his advisers. Upon the breaking out of the civil war he attached himself to the king's party, became chancellor of the exchequer and member of the privy-council; and after vainly attempting to bring about a reconciliation between the contending parties, he was appointed by the king to wait upon the Prince of Wales, who was first sent with an army to the west. Afterwards, on the continued ill success of the royal party, he retired to Jersey. Here Hyde remained for two years, while the prince was in France, and during that time began his History of the Rebellion. He likewise composed at Jersey the various writings which appeared in the king's name as answers to the manifestoes of the Parliament. On the capture of the king Hyde received orders to rejoin the Prince of Wales, which he endeavoured to obey. But he was becalmed and taken prisoner by pirates from Ostend. In September, 1649, he rejoined Charles at the Hague, who sent him to Madrid to see if any assistance could be obtained from the Spanish court. On the failure of this negotiation he retired to Antwerp, but soon resumed the business of the exiled court, of which he continued to be the most trusted adviser, first at Paris, and afterwards at the Hague, where Charles II. appointed him Lord-chancellor of England, in 1657. After Cromwell's death Edward Hyde contributed more than any other man to the success of the measures which placed Charles II. on the throne. He subsequently possessed the entire confidence of the king, who loaded him with favours. In 1660 he was elected Chancellor of the University of Oxford; in 1661 he was made peer, and Baron Hyde, Viscount Cornbury, and Earl of Clarendon. Many events occurred to disquiet him in the licentious court of Charles II.; among these was the marriage of the Duke of York, the king's brother, to his daughter. The duke, while at Breda, the residence of his sister, the Princess of Orange, became acquainted with Anne Hyde, Clarendon's eldest daughter, maid of honour to the princess, and married her secretly on 3d September, 1660, to legitimize their first child, born on the 22d of October. Anne was acknowledged as Duchess of York in December, 1660, and the king declared that this event had not changed his sentiments towards the chancellor. Two daughters, Anne and Mary, were the fruit of this marriage, both of whom ascended the British throne. In 1663 Lord Bristol made an attempt to impeach the chancellor in Parliament, which, though some of the acts of Clarendon's administration were questionable, proved unsuccessful. Attempts were also made to injure him in public opinion, while, on the other hand, his influence with the king was declining, as Charles had now less regard for an able minister than for the instruments of his prodigality. The Duke of Buckingham, moreover, was continually labouring to make the chancellor ridiculous in the eyes of the king, and his station as prime minister made the nation regard him as answerable for all the faults of the administration. The ill success of the war against Holland, the sale of Dunkirk, and other events, excited public indignation. The king's displeasure was changed into hatred when he saw his plan of repudiating his wife and marrying the beautiful Lady Stuart defeated by Clarendon, who effected a marriage between this lady and the Duke of Richmond. The king deprived him of his offices, and an impeachment for high treason was commenced against him. The Lords refused to imprison him on a general accusation by the Commons. This gave rise to a dispute between the two houses, to end which Clarendon, by the advice of his friends and the desire of the king, retired to Calais, leaving an exculpatory letter to the Lords, which they communicated to the Commons, who ordered it to be burned by the common hangman. The Lords still refused to join in his attainder, but agreed with the Commons in an act of banishment and incapacity. The hatred of the nation pursued him even to the Continent. At Evreux he was attacked by some British sailors, dangerously wounded, and with difficulty rescued from their hands. He lived six years at Montpellier, Moulins, and Rouen, at which latter place he died, December, 1674. His remains were afterwards carried to England, and buried in Westminster Abbey. —Lord Clarendon, as long as he was minister, was the friend and supporter of the king against the factious, and the defender of his country's freedom against the abuse of the royal power. Ingratitude and prejudice the more easily ruined him, as his stern and proud character prevented his gaining friends. Among his many writings, the most important is the History of the Rebellion, from 1641 down to the Restoration of Charles II. It is a very able work, although not free from prejudices.

CLARENDON, GEORGE WILLIAM FREDERICK VILLIERS, EARL OF, was the eldest son of the Hon. George Villiers, and of Theresa, daughter of the first Lord Boringdon. By his mother Lord Clarendon was indirectly related to the Hydes, the family of the great Earl of Clarendon, author of the History of the Rebellion. He was educated at Cambridge, entered the civil service at an early age, and in 1820 was attached to the embassy at St. Petersburg. In 1823 he was appointed by the Marquis of Anglesey to a commissionership of the excise in Dublin. During his tenure of this office he was engaged for several years in arranging the union of the English and Irish excise boards. In 1831 he was sent to France for the purpose of negotiating a commercial treaty, and in 1833 was appointed minister-plenipotentiary to the court of Madrid. Spain was at this time the scene of a civil war, originating in the rival claims to the crown of the possessor, Queen Christina, and the pretender Don Carlos. Mr. Villiers was instrumental in negotiating a treaty, signed in 1834, called the Quadruple Alliance, in which the four contracting parties —England, France, Spain, and Portugal—agreed to unite in expelling Don Carlos and Don Miguel, pretenders to the Spanish and Portuguese crowns, from the Peninsula, and was subsequently much consulted by the Spanish government.

At the beginning of 1839 Lord Clarendon, having succeeded during the previous year to his uncle's title, returned home to take his seat in the House of Lords. In January, 1840, he was appointed to succeed Lord Duncannon in the office of lord privy-seal; and in October he succeeded Lord Holland in the chancellorship of the duchy of Lancaster. In 1841 Sir Robert Peel came into office, and Lord Clarendon continued with his party in opposition until the accession of Lord John Russell in 1846. In the last year of his administration Sir Robert Peel inaugurated a new commercial policy by proposing the repeal of the corn-laws and the reduction of customs duties, which Lord Clarendon, as well as many other leaders of the opposition, supported. Lord Clarendon was at first appointed president of the board of trade in Lord J. Russell's ministry, and in the following year he was made Lord-lieutenant of Ireland. His vice-royalty extended from May, 1847, to Feb. 1852. The most notable events of the period were the great Irish famine, and the rebellion headed by Smith O'Brien, M.P., which ended in the defeat of the rebels by the police in a cabbage-garden, after months of threatening and systematic publication of sedition in the newspapers which espoused their cause. The state of feeling indicated by this ridiculous affair was not, however, without elements of danger to the public peace. Lord Clarendon's administration in regard to both of these difficulties has been deemed by dispassionate observers both firm and philanthropic; but his early popularity somewhat declined in Ireland, which was perhaps due to his impartiality in declining to favour the zealots either of the Catholic or the Orange party. He resigned with his party in Feb. 1852, when the Earl of Derby took office, which he held only till the ensuing December. Lord Derby was succeeded by the Earl of Aberdeen, who formed the coalition cabinet popularly known as the 'Ministry of all the Talents.' In this administration the seals of the foreign office were held for two months by Lord John Russell, who then resigned them, holding a seat in the cabinet without office, and was succeeded by Lord Clarendon (Feb. 1853), who retained this post till the resignation of the ministry on 30th Jan. 1855. The Crimean war, which began in October, 1853, and lasted throughout the whole period of this administration, was the great event by which it was signalized. The cause of its fall was a motion by Mr. Roebuck reflecting on the conduct of the war, and especially on the administration of the war-department under the Duke of Newcastle, which was carried in the House of Commons immediately on the opening of the session of 1855 by a majority of 157. After an ineffectual attempt by Lord Derby to form an administration with the co-operation of Lord Palmerston, which he failed in obtaining, the latter nobleman assumed office in Feb. 1855, and Lord Clarendon returned to the foreign office, the seals of which he retained till the exit of the ministry, 22d Feb. 1858. During this period the Russian war was brought to a successful termination, and Lord Clarendon, in conjunction with Lord Cowley, the British ambassador at Paris, conducted the peace negotiations at Paris as joint-plenipotentiary of Great Britain, and signed the Treaty of Paris on 30th March.

Lord Palmerston resumed office in June, 1859, on the defeat of the second Derby administration, with Lord John Russell as foreign secretary. This ministry terminated with the death of Lord Palmerston, 18th Oct. 1865. In 1861 Lord Clarendon was sent as ambassador-extraordinary to the coronation of the King of Prussia. He did not join the ministry until April, 1864, when he was appointed chancellor of the duchy of Lancaster. In the following administration, which was headed by Earl Russell, he resumed the direction of the foreign office. The last ministry of Lord Derby, 22d June, 1866, to 25th Feb. 1868; and the first of Mr. Disraeli, from the latter date to 2d Dec. 1868, formed another interregnum of office for the Liberal party, during which Lord Clarendon was again in opposition. He was sent in 1868 on a special mission to the pope and the King of Italy. In the ministry of Mr. Gladstone, which succeeded Mr. Disraeli's, Lord Clarendon again occupied the post of foreign secretary, and continued in office till his death, which occurred somewhat suddenly, 27th June, 1870.

For the office of foreign secretary, which he held so long, Lord Clarendon was generally admitted to possess high qualifications; but it was complained, even by his admirers, that he adhered too long to the tradition of secrecy attaching to the foreign office. As a statesman he was remarkable rather for a liberality and large-heartedness, which gave a conciliatory tone to his negotiations with foreign powers, and for the undeviating rectitude of his conduct, than for any commanding qualities of intellect. He married, June 4, 1839, Lady Catherine Barham, daughter of the first Earl of Verulam, and widow of John Barham, Esq., of Stockbridge, Hants, by whom he left three sons and three daughters. He was made G.C.B (civil) in 1838; K.G., 1849; D.C.L. Oxford, 1856. He was chancellor of the Queen's University in Ireland from its foundation.

CLARENDON PRESS, Oxford, the name by which the press of the University of Oxford is distinguished. In January, 1586, delegates *de impressione librorum* were appointed by the Convocation of the University. About this time Joseph Barnes was styled 'Printer to the University,' and others bore the title after him. In 1633 Archbishop Laud procured letters patent granting a large license in printing to the university, with a view to the publication of manuscripts from the Bodleian Library. The work was carried on at first in hired premises; then from 1669 in the Sheldonian Theatre; from 1713 to 1830 in the building known as the Clarendon, the cost of which was defrayed partly from the sale of Lord Chancellor Clarendon's History of the Rebellion, the copyright of which was given to the university. The management of the printing-office is committed to a delegacy consisting of the vice-chancellor and ten other members of Convocation, nominated by the vice-chancellor and proctors, as vacancies occur. Five are perpetual delegates, and five are nominated for a term of seven years. The south side of the present building (built to provide the additional accommodation required and opened in 1830) is appropriated to the printing of Bibles and prayer-books. The north, called the 'learned' or 'classical' side is assigned for the printing of university documents, books printed by authority of the delegates, and those sent in by private authors and publishers. Those printed for the university itself (but no others) bear on the imprint 'E Typographeo Clarendoniano', or 'At the Clarendon Press'. Some admirable specimens of typography have been produced by the Clarendon Press.

CLARET. See Bordelais Wines.

CLARICHORD, or Clavichord, a keyed instrument, now out of use, somewhat in the form of a spinet, and the strings of which are supported by five bridges. One distinction in the clarichord is that the strings are covered with pieces of cloth, which render the sound sweeter, and at the same time deaden it, so as to prevent its being heard at any considerable distance. On this account it was formerly much used by the nuns, who could practise on it without disturbing the dormitory. It is sometimes called the *dumb spinet*.

CLARIFICATION, or the separation of the insoluble particles that prevent a liquid from being transparent, may be performed by *depuration*, *filtration*, or *coagulation*. In the first of these operations the liquid is permitted to subside, without being in the least disturbed, until all the particles which were in suspension are precipitated; it is then decanted. This mode of clarification can only be used when the substance on which we operate is in a large quantity, or is of a nature not to be altered during the time necessary to complete this operation, and finally when its specific gravity is less than that of the particles which render it turbid. Filtration is a process by which a liquid is strained through a body, the interstices of which are small enough to stop the solid particles contained in it. Filters of wool, linen, paper, powdered glass, sand, or charcoal, may be used, according as the liquid is more or less dense, or of a nature to operate upon any one of these bodies. Finally, clarification by coagulation is performed with the assistance of albumen (as isinglass or white of eggs) added to the liquor for this purpose, which, by the action of heat, of acids, &c., becomes solid, forms a mass, and precipitates the extraneous substances. Clarification is also now commonly effected by 'centrifugal machines.'

CLARINET, or Clarionet, a wind-instrument of the reed kind, with a trumpet-formed mouth, and played by holes and keys. Its scale, though including every semitone within its extremes, is virtually defective. Its lowest note is E below the F clef, from which it is capable, in the hands of good performers, of ascending more than three octaves. Its powers through this compass are not everywhere equal; the player, therefore, has not a free choice in his keys, being generally confined to those of C and F, which indeed are the only keys in which the clarinet is heard to advantage. The music for this instrument is therefore usually written in those keys. There are, however, B flat clarinets, A clarinets, D clarinets, B clarinets, and G clarinets; the three latter are scarcely ever used in Britain.

CLARION, a musical instrument of the trumpet kind, with a narrower tube and a higher and shriller tone than the common trumpet.

CLARK, Sir James, Bart., physician, was born at Findlater, Banff, 14th Dec. 1788. He was educated first at the grammar-school of Fordyce, and King's College, Aberdeen, from which he afterwards received the degree of M.A. He subsequently studied medicine at the University of Edinburgh, and passed his examination at the College of Surgeons both of Edinburgh and London. He entered the navy as assistant-surgeon in 1809, and continued in the service till 1815, when he returned to Edinburgh. He took his degree of M.D. in 1817, and after devoting some time to foreign travel, settled in Rome, where he continued to practise from 1818 to 1826. During this period he laid a wide foundation for his medical experience by visiting the principal medical schools and universities in Italy, France, and Germany, and acquainting himself with their modes of treatment. He also visited with the same view most of the mineral springs of the Continent, making himself acquainted with their composition and influence on the human frame. He returned to England in 1826, and was made a member of senate of London University, and two years later was appointed physician to St. George's Parochial Infirmary. In 1832 he was elected a fellow of the Royal Society, and was frequently chosen a member of its council. He became physician to the Duchess of Kent in 1835, and on the accession of Queen Victoria he was appointed first physician in ordinary to the queen, and was shortly afterwards made a baronet. He retired from practice several years before his death, which took place at Bagshot Park, a residence assigned him by her majesty, on 29th June, 1870; but he continued till near the close of his life to act as consulting-physician to the royal family.

Soon after his return to England Sir James Clark published, as a result of his continental observations, a work On the Sanative Influence of Climate (1829), and in 1835 he published a Treatise on Pulmonary Consumption and Scrofula. He was an occasional contributor to the journals of medical science.

CLARKE, Adam, an eminent Methodist preacher and scholar, was born in 1762 in the county of Londonderry, Ireland, his father being of an English family, and his mother a Scotchwoman. He became an itinerant Methodist preacher in 1782, and continued to travel in various circuits till 1805, when he took up his residence in London, where he passed a considerable part of his subsequent life. He died of cholera at Bayswater, August 26, 1832. He was learned in the oriental languages, and published a commentary on the Scriptures (1810–26), and various other works, among the rest a Bibliographical Dictionary in eight or nine 12mo vols.

CLARKE, Edward Daniel, a celebrated traveller, professor of mineralogy at Cambridge, which university he enriched with the fruits of his researches in foreign countries. He was born at Willingdon, Sussex, in 1769. He entered Jesus College, Cambridge, in 1786; and having taken his degree in 1790, was engaged as tutor to the Hon. Henry Tufton, nephew of the Duke of Dorset, with whom he made a tour through Great Britain. Two years later he accompanied Lord Berwick to Italy. In 1798 he took up his residence at Cambridge, having been elected a fellow of his college. Next year he set out with Mr. Cripps on an extensive and laborious tour through Denmark, Sweden, Lapland, Finland, Russia, Tartary, Circassia, Asia Minor, Syria, Palestine, Egypt, Greece, and Turkey, returning in 1802 through Germany and France. On his return he obtained from the university to which he belonged the honorary degree of LL.D., in consideration of the services rendered to its public libraries and institutions by his liberal contributions, among which the greatest, perhaps, in value is the celebrated manuscript of Plato's works, with nearly 100 others, and a colossal statue from Eleusis, believed by him to be that of Demeter (Ceres). To him also the British nation is indebted for the acquisition of the famous sarcophagus of Alexander the Great, which he discovered in the possession of the French troops in Egypt, and which was by his means surrendered to the British army. Among his works are dissertations upon these two trophies of art. In 1807 he commenced a course of lectures on mineralogy at Cambridge, and in 1808 a professorship of mineralogy was instituted there in his favour. He himself had made a splendid collection of mineralogical specimens, which was purchased after his death by Cambridge University. In 1805 he became vicar of Harlton, and in 1809 rector of Yeldham, Essex. In 1817 he was appointed librarian of Cambridge University. He died in London on March 9, 1822. A complete edition of his travels appeared in six vols. 4to (1810–23), and another in eleven vols. 8vo (1816–24), under the title of Travels in Various Countries of Europe, Asia, and Africa. His Travels, which are the most popular of his works, are attractive from the enthusiasm of the writer and his prolific imagination. See Otter's Life and Remains (2 vols. 1825).

CLARKE, SAMUEL, D.D., a celebrated theological and philosophical writer, was born on October 11, 1675, at Norwich, of which city his father was an alderman. He was educated at Caius College, Cambridge. Whilst at the university he diligently cultivated a knowledge of the Scriptures in the original languages, together with the study of the early fathers of the church, and before the age of twenty-one he largely contributed to diffuse the Newtonian philosophy. On entering into orders he became chaplain to Dr. Moore, bishop of Norwich. and first became an author in his own profession in 1699, when he published Three Practical Essays upon Baptism, Confirmation, and Repentance. This work was followed by Reflections on a Book called Amyntor (by Toland), relating to the authenticity of writings not received into the canon of Scripture. In 1701 he published his Paraphrase on the Four Gospels, which induced Dr. Moore to present him with two small livings in and near Norwich. In 1704 he was appointed to preach the Boylean lecture at Oxford, when he chose for his subject, The Being and Attributes of God, and gave so much satisfaction that he was appointed to the same office the next year, when he delivered a course of sermons on The Evidences of Natural and Revealed Religion. These sermons greatly raised the author's reputation as a close and acute reasoner, although his argument, *a priori*, for the existence of a God was deemed by some too subtle and metaphysical. Like Spinoza, against whom it was directed, it proceeds on the assumption that time and space must always have existed, because the conception of their non-existence is impossible; and that, being attributes, they must have existed in a substance. Pope satirized it in the lines (Dunciad, book iv. l. 471)—

> 'We nobly take the high priori road,
> And reason downward till we doubt of God'.

In his Evidences he endeavours to reduce moral philosophy to a mathematical certainty, which also gave rise to much controversy. A phrase of which he made frequent use, 'the eternal fitness of things', became a fashionable one in the ethical vocabulary of the day, and also afforded a subject of satire. In 1706 he published a letter on the Immortality of the Soul, and a Latin version of the Optics of Sir Isaac Newton, who, in acknowledgment, presented him with £500 for his five children. His patron, Dr. Moore, now procured for him an appointment in London as rector of St. Benet's, and shortly afterwards the rectorship of St James's and a chaplaincy to Queen Anne. On this occasion he took his degree as D.D. In 1712 he edited a fine edition of Cæsar's Commentaries, dedicated to the Duke of Marlborough, and in the same year published a work which involved him in endless controversy, entitled The Scripture Doctrine of the Trinity. In this production all the passages of Scripture which bear on the doctrine, directly or indirectly, are critically examined, but the result of the author's reasonings was so different from the opinions of the Church of England that it became a subject of complaint in the Lower House of Convocation. Several controversial pieces were written on this occasion, the chief champion of orthodoxy being Dr. Waterland. In 1715 and 1716 a friendly disputation was carried on between Dr. Clarke and Leibnitz, in which Clarke advocated the doctrine of free-will. The death of Leibnitz left the controversy undecided, and Clarke resumed it in his reply to a Philosophical Inquiry concerning Liberty, by Anthony Collins, a disciple of Locke, in 1717. In 1724 he published a volume consisting of seventeen sermons, and on the death of Sir Isaac Newton, in 1727, he declined the offer of the mastership of the mint. In 1728 he wrote a letter On the Proportion of Velocity and Force in Bodies in Motion. Next year he published the first twelve books of Homer's Iliad, with a Latin version, the remaining books being published by his son in 1732. He died suddenly on May 17, 1729. An Exposition of the Church Catechism, with ten volumes of sermons, were published after his death.

CLARKE RIVER, or **FLATHEAD RIVER**, a river of the United States, rising in the Rocky Mountains in Western Montana, about 45° 30′ N. lat. After a winding N.W. course of about 650 miles between the Missouri and Bitter Root Ranges, during which it expands into an extensive lake, it falls into the Columbia, in the state of Washington, lat. 48° 50′ N.; lon. 117° 50′ W. It is also called the Clarke Fork of the Columbia River. Gold is found near it in Montana.

CLARKSON, THOMAS, a noted emancipationist and advocate of the negro race, was born on 28th March, 1760, at Wisbeach, in Cambridgeshire, where his father was master of the free grammar-school. He was originally intended for the church, and studied at St. John's College, Cambridge, where he gained the vice-chancellor's prize for a Latin essay on the theme, 'Anne liceat invitos in servitutem dare? (Is it lawful to make slaves of men against their will?) In the course of collecting materials for this dissertation his feelings had been greatly roused by the accounts of the miseries inflicted on the unhappy Africans; and the project of accomplishing their relief, and the abolition of the slave-trade, took possession of him as the leading principle of his life. He formed a connection with a Quaker association for the suppression of negro slavery, and was introduced to Mr. Wilberforce and other distinguished individuals. While the latter advocated the cause of abolition in Parliament Mr. Clarkson was indefatigable in obtaining information and evidence on the subject, in attending meetings in different parts of the country, and generally conducting the agitation throughout England for the suppression of the slave traffic. In Feb. 1788, a committee of the privy council made an inquiry into the state of the African trade, and in that year a bill mitigating some of the worst cruelties of the traffic was passed. Clarkson in 1789 crossed over to France, and resided in Paris for six months, endeavouring, though unsuccessfully, to obtain the co-operation of the revolutionary government. In 1791 a motion by Wilberforce in favour of putting an end to the traffic was lost by 163 to 88; but his labours, and those of his party, were at last successful in England, the slave-trade being abolished by a bill passed on 25th March, 1807. This point gained, their next effort was to procure the total abolition of slavery in the British colonies, and in this also, after a long struggle, they succeeded, by the passing of the emancipation act in 1833. In the latter part of his life Clarkson became incapacitated by blindness, arising from cataract, from appearing in public; but an operation (in 1836) to which he submitted completely restored his sight. He made his last public appearance at a meeting of the Anti-slavery Convention at Exeter Hall in 1840. His death took place on 26th September, 1846, at his residence of Playford Hall, near Ipswich. His literary works comprise—A Portraiture of Quakerism (three vols. 8vo, 1806); History of the Abolition of the African Slave-trade (two vols. 8vo, 1808); Memoirs of the Private and Public Life of William Penn (two vols. 8vo, 1813; republished in 1849 by W. E. Foster, with preface replying to Macaulay's charges against Penn); Researches, Antediluvian, Patriarchal, and Historical (8vo, 1836); besides numerous pamphlets and small works.

CLASS, CLASSIFYING, CLASSIFICATION. When the domain of a science comprehends a very great number of objects which it is necessary to describe, or whose analogies and differences require to be assigned, it is always useful, and sometimes indispensable, to make a methodical distribution of these objects, to group those which present the greatest number of common characters, to form with these groups new assemblages, continuing the process till a limit is reached where this mode of generalizing may be stopped. The highest assemblage in this ascending series is a *class* (though this term may not be technically applied to it), the procedure necessary in forming it is *classifying*, and the result, extending over some entire branch of natural science, is a *classification*. We do not begin to classify till we feel the need of it, for the task requires analysis, multiplied comparisons, and researches as to the means of generalizing the particular and isolated notions which we had previously been contented to amass without regular arrangement. It is only, however, after the revision necessary for such arrangement has been undertaken that science can be said to have begun. The first attempts at generalization and classification often exercise a very important influence on the future progress of any science, and may even extend to the period when it seems to be approaching its perfection. A science consists principally in the relations of the facts observed, or knowledge acquired in connection with it. If the relations thus established are founded on accurate observations, they become in fact laws of nature, the most important and most prolific truths which human reason is able to discover. But if the imagination has been allowed to take part in the work, if it has either furnished the materials or directed the construction of the edifice, it must sooner or later be demolished, and rebuilt with better selected materials and on more solid foundations. In modern times geology commenced with faults of this description, and still seems to have difficulty in avoiding them. Natural history, to which a good classification is so essential, was not very fortunate in its first combinations: systems took possession of it, and too often blinded the inquirer to great truths which otherwise he could hardly have failed to discover. Influenced by this love of system, many, instead of submitting to the laborious investigation of facts, have come forward with some new fanciful combination, and made it almost their sole business to secure the credit of their particular classifications by overthrowing those of their predecessors or rivals. In a subject so comprehensive as natural history it seems vain to hope for a perfect classification until the resources of embryology are exhausted. Zoology is gradually tending towards a consistent system of classification, the basis of which is the resemblances of animals at various periods of their growth. The impulse to this line of research was given by Darwin. Being a strictly natural method, inasmuch as the affinities by common descent are sought after to the neglect of mere outward resemblances at a later period of life, the arrangements suggested by it to different naturalists show a considerable amount of harmony, and even those who oppose Darwin acknowledge the simplicity and consistency of embryological or genealogical classification.

CLASSIC, from the Latin *classicus*, the *classici* in ancient Rome forming the highest of the six classes into which the people were divided. (See CENSUS.) From this circumstance the Greek and Roman authors were called *classics*, that is, the writers of the first rank, the models. There is of course a great diversity of value among them; but their superiority to the writers of modern Europe at the time of the revival of letters was so great that it was very natural for their admirers to give them collectively the name of *classics*. Subsequently the word *classical* came to be employed in a wider sense, being applied both to the standard works of any nation, and to ancient literature and art, in contradistinction to the modern and especially to the romantic.

On the revival of learning in Europe the manifest superiority of the ancient classics to the crude productions of a semi-barbarous period gave rise to a large amount of servile imitation. This was especially the case in those countries whose languages most nearly approximated to the classical models, the Latin-speaking nations of Southern and Central Europe, among whom the revival of classical learning first took place. German literature, which sprung into existence more recently, has perhaps most completely escaped the infection. In England the trammels of this sort of literary despotism were most experienced in the higher education, which was cast completely in a classical mould, and from force of habit has in great measure retained it, but the form and substance of the native literature have on the whole been wonderfully little affected by this exotic discipline. In Italy the early literature was very strongly penetrated with the classical spirit, but the powerful imagination of the people rejected a servile imitation, and a bold originality characterizes the best Italian writers. It was in France, where taste assumes an empire in literary matters somewhat hostile to originality, that the spirit of imitation took the strongest hold of the national genius, and so completely penetrated as to become almost indigenous to it. In the reign of Louis XIV., the golden age of French literature, classical subjects and classical models were run upon with a dreary monotony. Classical rules were received with an unquestioning allegiance, as if they had been the laws of Nature herself, and the chief glory even of those who boasted of excelling the ancients was to follow more rigidly the canons of ancient art than the ancients themselves. Admirable as much French literature in many respects is, it has not escaped the consequences of this false start. There is an inevitable coldness and unreality about the imitation of forms which have lost their original meaning, and even the vivacity of French genius hardly suffices to animate the rigidity of the models demanded by French taste, while a great deal of the older French criticism is nearly unintelligible elsewhere in Europe. Under the influence of Hugo and others, however, France has latterly escaped from the trammels of her classical age.

CLAUDE, St., a town of France, department of the Jura, at the confluence of the Bienne and Tacon, 25 miles south-east of Lons-le-Saunier. It owed its origin to a celebrated Benedictine abbey, founded in the fifth century, and possessed of very large and even very oppressive privileges. The town is well built, is the see of a bishop, and has several handsome edifices, among others a cathedral and communal college, and a fine promenade along the Bienne. It is celebrated for its fancy turnery, snuff and fancy boxes, cutting of precious stones, &c. Pop. (1896), 9125.

CLAUDE LORRAINE (or Lorrain), so called, was one of the most distinguished landscape-painters. His real name was *Claude Gellée*: he was called *Lorraine* from the province of this name, where he was born (at Chamagne, dep. Vosges) in 1600 of poor parents, whom he lost early. Not much is known of the particulars of his life, some of which are differently given by different writers. When twelve years old it is said he went to live with his brother, an engraver in wood at Freiburg. Afterwards a relation of his took him to Rome, where the sight of some paintings of Gottfried Wals enchanted him so much that in spite of his poverty, he travelled to Naples to study with the artist. Returning to Rome after a stay of two years, he was employed by the landscape-painter Agostino Tassi, as a colour-grinder and otherwise. He is next said to have studied, in Lombardy, the paintings of Giorgione and Titian, whereby his colouring and *chiaroscuro* were greatly improved. After making a journey into his native country, and residing for some time at Nancy, he settled in 1627 in Rome. Here he attracted the notice of Cardinal Bentivoglio, and was introduced by him to Pope Urban VIII., who gave him orders for four paintings. His position being now assured, he had many other eminent patrons, and was enabled to live much at his ease until 1682, when he died of the gout. The principal galleries of England, France, Spain, Russia, and Germany are adorned with his productions. The public and private galleries of England are richest in these works, a number being in the National Gallery, others at Dulwich, at Windsor Castle, and elsewhere. Claude possessed the greatest power of invention, by which he gave an inexhaustible variety to his paintings, united with an ardent and persevering study of nature. The truth with which he portrays the effect of the sun in every part of the day, soft breezes playing through the tops of the trees, and all the delicate beauties of nature, is surprising; and all his rivals fell far short of equalling the dewy humidity which he threw over dark, shadowy places. His figures are poor, and he used to say—'I sell my landscapes, and give my figures into the bargain'. In a great number of his paintings the figures are the work of other artists. Claude most frequently chooses views in which the eye loses itself in agreeable prospects, without being able to define their limits. He often introduces grand architectural structures, and makes his landscapes the scenes of mythological and historical events. Claude himself made a collection of some two hundred drawings of his pictures. This precious record, now in the collection of the Duke of Devonshire, is known as the *Liber Veritatis*. See Lady Dilke's Claude Lorrain, sa Vie et ses Œuvres (Paris, 1884).

CLAUDIANUS, Claudius, commonly known as Claudian, a late Latin poet, a native of Alexandria, who came to Rome in 395 A.D., and died probably before 415 at latest, though nothing is known of him after 404. His poems gained him such renown that a statue was erected to his honour in the forum of Trajan. Besides several panegyrical poems on Honorius, Stilicho, and others, we possess his epic, the Rape of Proserpine, an unfinished Gigantomachia, idyls, epigrams, epistles, and occasional poems. Claudian, whose native tongue was Greek, possessed a remarkable command of the Latin language, and displays poetic powers of a high character, brilliancy of diction, truth of description, and richness of illustration. The best editions of his works are those of Gesner (1759), Burmann (Amsterdam, 1760), Jeep (1876–79), and Koch (1893.) There is a metrical translation of his works, by A. Hawkins, in two vols. 8vo (1817).

CLAUDIUS, often also called *Clodius*, the name of a distinguished Roman family, which under its head Attus Clausus, a Sabine, settled at Rome about B.C. 504, and soon branched off into a patrician and a plebeian stock. Attus, admitted among the patricians, changed his name to Appius Claudius. The patrician Claudii were characterized throughout their whole history by their haughty and tyrannical bearing, displayed particularly towards the plebeians; while the plebeian branch were equally distinguished for the resolute assertion of the rights of their order. The patrician Claudii counted among their members twenty-eight consuls, five dictators, seven censors, &c. The most distinguished members of the plebeian branch bore the cognomen of Marcellus. See Appius Claudius, also following articles.

CLAUDIUS, or, in full, Tiberius Claudius Drusus Nero Germanicus, a Roman emperor, the youngest son of the elder Claudius Drusus Nero and Antonia the younger, the daughter of Augustus' sister, born at Lyons (10 B.C.), grew up without any education, for the most part among slaves and women, and was an object of ridicule and scorn at court. He lived as an unimportant private man, and occupied himself with literature. Among other works he wrote a Roman history, embracing the period from the death of Cæsar to his own time, in forty-three volumes, and also his own life. After the murder of Caligula, the body-guard, who were ransacking the palace, discovered him secreted in a corner, dragged him out, and proclaimed him emperor (41 A.D.). The senate, who had determined on the restoration of the republic, were forced to confirm the appointment. Claudius, suddenly transferred from retirement and oppression to uncontrolled power, distinguished the beginning of his reign by some praiseworthy acts; he recalled the exiles, and restored their estates to them; embellished Rome, and erected several large buildings for the public good. He made Mauritania a Roman province; his armies fought successfully against the Germans, and kept possession of several strong places in Britain. But he sunk into debauchery and voluptuousness; and his wives, particularly the infamous Messalina, together with his freedmen, administered the government, sold offices and places of honour, and committed the greatest atrocities unpunished. He died of poison administered by his fourth wife, Agrippina (mother of Nero), at the age of sixty-three, A.D. 54. His deification was the cause of Seneca's pasquinade entitled Apokolokynthosis.

CLAUDIUS, APPIUS, surnamed CÆCUS, or the blind, an ancient Roman, elected censor in B.C. 312, in which office he made himself notorious by his arbitrary proceedings, for the purpose of weakening the influence of the plebeians, by admitting into their number the sons and grandsons of freedmen, and others of the lowest of the people. He performed an important service, however, by the construction of the road and the aqueduct which bear his name, though he is said to have procured the removal of his colleagues from office that he might be able to appropriate the whole honour of these works to himself. Overweening ambition was the distinguishing feature in his character. In his old age he became blind; but when Cineas, the deputy of Pyrrhus (B.C. 280), had gained over the senate, which was on the point of accepting peace on the terms offered by him, Appius caused himself to be led into the senate-house, and in a celebrated speech, of which Cicero speaks in the highest terms, insisted and induced the senate to resolve that they would listen to no proposals of peace in which the evacuation of Italy was not made an essential condition. From his two sons spring the two best known branches of the Claudian family, the one distinguished by the surname of Pulcher, and the other by that of Nero.

CLAUDIUS, MATTHIAS (called *Asmus*, or the *Wandsbeck Messenger*), a German poet, whose prose and poetry bear a peculiar stamp of humour, frankness, and cordiality, was born in 1741 at Rheinfeld, in Holstein, near Lübeck. In 1775 he made a collection of his compositions, which had appeared in the Wandsbeck Messenger and other periodicals, with the addition of some which had not been printed, and gave the collection the title Asmus omnia sua Secum Portans, or Complete Works of the Wansbeck Messenger (completed in 1812, in eight vols.) He wrote on a great variety of subjects. All his works are of a popular character. They are written in a natural, intelligible, and often humorous style, and support the cause of good morals, benevolence, patriotism, and piety, while they attack folly and vice with the weapons of ridicule and scorn. Many of his songs have been set to music by the first composers, and have become a part of the national melodies. In the latter part of his life he became a convert to religious mysticism, and died at Hamburg, January 21, 1815, after having filled several public offices.

CLAUSENBURG, or COLOSVAR. See KLAUSENBURG.

CLAUSTHAL. See KLAUSTHAL.

CLAVERHOUSE. See GRAHAM (JOHN).

CLAVICHORD. See CLARICHORD.

CLAVICLE, in anatomy, is a long bone placed horizontally at the upper part of the thorax, in an oblique direction, and forming the lower limit of the anterior cervical region. It is bent upon itself somewhat in the form of the italic *s*, and is both longer and more decidedly curved in woman than in man. It articulates with the sternum on one side, and with the acromion apophysis on the other, thus uniting the shoulder to the thorax, and forming a kind of buttress to it when the muscles between it and the thorax tend to bring it forward. It also serves as an attachment to a part of the muscles of the shoulder and neck. In fetal life the clavicle appears between the thirtieth and thirty-fifth day, and is developed from a single point of ossification. The principal diseases to which the clavicle is subject are fracture, dislocation, necrosis, and caries. Fractures are most frequently produced indirectly by the shock given to other parts by falls, as a severe blow on the elbow, or by a direct blow upon the bone itself, as by the blow of a stick, or even a fist. Dislocation, produced nearly in the same way, is much more rare than fracture, and when it does take place is more frequently at the sternal than at the scapular extremity. When necrosis and caries affect the clavicle the removal of a portion of it sometimes becomes necessary.

CLAVIGERO, FRANCESCO SAVERIO, a Spanish historian of some note, was a native of Vera Cruz, in Mexico, and born about the year 1720. He was educated as an ecclesiastic, and resided thirty-six years in the provinces of New Spain, where he acquired the languages of the Mexicans and other indigenous nations, collected many of their traditions, and studied their historical paintings and other monuments of antiquity. The first of his researches was a History of Mexico, written in Italian, of which an English translation in two vols. 4to was published in 1787. This is a most comprehensive work, affording a great deal of information relative to the natural and civil history, antiquities, and religion of Mexico; but it displays more industry than judgment on the part of the author. On the suppression of the Jesuits by the Spanish government in 1767 Clavigero went to Italy, the pope assigning him a residence in the town of Cesena. Here he wrote his Mexican History; and here, too, died in 1793.

CLAVIJO Y FLAJARDO, DON JOSEPH, a Spaniard, chiefly known by his quarrel with Beaumarchais. He lived in Madrid, where he had the reputation of an intelligent scholar, and had published a journal, El Pensador, and other useful works, when his connection with the sister of Beaumarchais, whom he had loved and then forsaken, gave rise to an affair of honour between him and the brother of the lady, who was formidable for talent rather than courage. This affair, in which he narrowly escaped with his life, deprived him of his office and the good opinion of his fellow-citizens. He passed the remainder of his days under a kind of dishonour, which the representations of his adversary had brought upon him. For more than twenty years he superintended the publication of the Mercurio Historico y Politico de Madrid, with which he had been intrusted as early as 1773. He likewise translated Buffon's Natural History into Spanish (Madrid, 1785-90, twelve vols.) He was vice-director of the Cabinet of Natural History, and director of the Theatre de los Sitios, when he died in 1806. Far from resembling the detestable portrait which Beaumarchais draws of him, Clavijo was of a mild disposition, pleasing manners, and a clear understanding. Goethe founded his tragedy Clavigo on Beaumarchais' story.

CLAVIS (Latin for *key*) is often used for a drawing, an index, &c., which serves as a guide to the understanding of another work; for instance, *clavis Ciceronia*, *clavis Homerica*, &c.

CLAY is a mixture of decomposed minerals, and hence it is by no means uniform in its composition. Several varieties soften in water, and allow themselves to be kneaded and formed into moulds—a property by which they are fitted for the use so commonly made of them. They are opaque, dull and earthy, and uncrystallized; when breathed upon they emit a peculiar odour. Some are easily fusible, others refractory; some acquire particular tints, others lose their colour and become white when exposed to a strong heat; upon all of which properties their applicability to various uses depends.

They occur in beds near the surface of the earth, or covered by the soil in the formations of brown and black coal. In the latter situation they often contain remains of vegetables, and are called *slate-clay*, which is intimately related to bituminous shale and alum-earth. Clay is essentially a hydrated aluminic silicate, but there are generally present, in addition, variable quantities of magnesia, lime, and oxide of iron. The fundamental constituent is *kaolinite*. Pure clay is white, but the admixture of various substances usually gives it a grayish, yellow, brown, or green colour. The varieties of clay are important for applications in pottery, in manufacturing stoneware and porcelain, in constructing furnaces for metallurgic operations, &c. *Indurated clay*, or *clay-stone*, is clay in its highest state of induration. It is not easily diffused in water, and does not form with it a ductile paste. *Porcelain clay*, *kaolin*, *china clay*, or *Cornish clay*, used in making porcelain, in paper-making, and in the manufacture of alum, &c., is white, with occasional shades of yellow and gray. It is dull and opaque; feels soft; in water it falls to powder, and when kneaded it forms a ductile paste. This is the purest form of clay, but quartz and other substances are always present in it. It has long been utilized in China, and is obtained and worked in Cornwall and Devon, near Limoges in France, and elsewhere. *Potter's-clay* and *pipe-clay* are similar, but less pure, generally of a yellowish or grayish colour, and very free from iron, lime, and magnesia. *Fire-clay* is a very refractory variety, always found lying immediately below the coal. It is greenish-gray in colour, and is used for making fire-bricks, crucibles for melting cast-steel, retorts, for lining furnaces, and such purposes. The best fire-clay is that of Stourbridge, but good varieties are obtained elsewhere in Britain. It is mined in much the same way as coal, and often along with the latter. *Loam* is the same substance mixed with sand, oxide of iron, and various other foreign ingredients. The *boles*, which are of a red or yellow colour, are of a similar composition, and appear to owe their colours to oxide of iron. They are distinguished by their conchoidal fracture. The *ochres* are similar to the boles, containing only more oxide of iron. *Fuller's-earth* has an earthy fracture, sometimes slaty, and is dull and opaque. In water it falls to powder, without forming a ductile paste. It is used to remove grease from cloth. *Tripoli* is found loose or indurated; its fracture is earthy; it feels harsh and dry; does not adhere to the tongue. It is used for polishing the metals and glass. *Boulder-clay* is a hard clay of a dark-brown colour, which has received its name from the rounded masses of rock of all sizes that are found embedded in it. Its origin is now assigned to the action of ice, and the deposit is often known as the *drift*, and by various local names, according to the figure and composition which it exhibits. Clay is one of the commonest ingredients of soils. Its property of absorbing ammonia and other gases on manured soils renders it valuable to the farmer. The best wheats both in Britain and the Continent are grown on calcareous clays, as also the finest fruits and flowers of the rosaceous kind, such as apples, pears, plums, cherries, roses, &c. Soils of this description when first subjected to cultivation are heavy and expensive to work; but on being drained, limed, and well manured, they yield magnificent crops of wheat, beans, clover, &c.

CLAY, HENRY, a distinguished American statesman, was the son of a Baptist preacher, and was born in Hanover county, Virginia, on 12th April, 1777. His father died when Henry was only four years old, leaving his family in straitened circumstances. At the age of fifteen he was placed as a clerk in the office of one of the state officials, and afterwards in that of the attorney-general of Virginia. In 1797 he commenced business as a lawyer at Lexington in Kentucky. In this sphere he achieved rapid success, and having early turned his attention to the art of oratory, he soon became famous as a public speaker, and took an active part in political matters. At the age of twenty-six he was chosen one of the representatives for Fayette county in the Kentucky legislature, and was repeatedly rechosen. In 1806 he was elected to the United States Senate; and from this period to the close of his life his name is intimately connected, sometimes as a senator, sometimes as a member of the House of Representatives, with all the great political movements in America. He was a leading advocate of the war of 1812 against Britain, and in 1814 he proceeded to Europe and acted as one of the commissioners for adjusting the treaty of peace at Ghent by which it was terminated. In the crisis created in 1819–20 by the proposed admission to the union of Missouri, a slave-holding state, Clay took a leading part, and it was largely owing to his efforts that a compromise was reached. He was a candidate for the presidency in 1824, 1832, and 1844, but was unsuccessful on all these occasions, though the last election was very closely contested between him and Mr. Polk. He was often speaker in the Houses of Congress, and in 1824–28 he was secretary of state. He died at Washington on 29th June, 1852. His writings and speeches have been frequently published, the most complete collection, with biography, being that of the Rev. Calvin Colton (six vols., New York, revised edition, 1865).

CLEAR, CAPE, a high promontory at the southern extremity of Clear Island, and the most southern point of Ireland, about 7½ miles S.E. of Baltimore, county Cork. It stands 400 feet above the sea-level, and forms a prominent landmark to seamen.—CLEAR ISLAND is about 3½ miles long and about 1 broad. It is wild and romantic, and forms a parish with an area of 1504 acres. The male inhabitants are almost exclusively employed in fishing. There is a telegraph station in the island, by which early intelligence is communicated from steamers arriving from America or elsewhere. Pop. 584.

CLEARING-HOUSE, BANKING, an establishment in large cities where there are many banks, to which each bank connected with it sends every day in order to have its business with the other banks adjusted. The sums due by and to the banks among themselves are here set off against each other and the balance paid or received. In London the balance used to be settled in cash or Bank of England notes. Now, however, the various banking companies and the clearing-house itself have accounts at the Bank of England, and the balances are settled by transfers from one account to another. The clearing-house system was introduced by the London private banking firms in 1775, but the joint-stock companies have long been permitted to share its advantages, and it has been extended to the provincial banks.—*The Railway Clearing-house* is an association instituted to assist the various companies to carry on their traffic over different lines, with all the conveniences of one line. The claims of the railway companies against each other on account of traffic that has passed over more than one line, are adjusted here, and the expenses of keeping up the clearing-house are apportioned among the different companies. Owing to the clearing-house system a passenger can purchase one single ticket which will carry him over lines belonging to several companies, and parcels are conveyed through without additional booking, fresh entries, and consequent delay.

CLEAVAGE, a term used in mineralogy and geology to express the mode in which any body may most readily be or naturally tends to be split up into fragments. The regular structure of most crystallized bodies becomes manifest as soon as they are broken. Each fragment presents the form of a small polyhedron, and the very dust appears under the microscope an assemblage of minute solids, regularly terminated. In this process common salt and lead-ore break up into small cubes, fluor-spar and the diamond into octahedrons, sulphate of barytes and the topaz into rhomboidal prisms, calcareous spar, the ruby, and the sapphire into rhombohedrons, &c. The directions in which all those bodies thus break up are called their planes of cleavage. It must not be supposed, however, that all inorganic crystallized substances possess this property. Several of them break up only into irregular fragments, as the rock-crystal, the garnet, the emerald, &c. In others the cleavage is only in two directions, and sometimes only in one, and consequently produces no regular solid. Important information is often obtained by attending to cleavage, inasmuch as it may serve to ascertain the different bodies which belong to the same system of crystallization, or to distinguish between those which belong to different systems, even when their external forms happen from any cause to be disguised or destroyed. The term is employed by geologists in a somewhat different sense, and applied to non-crystallized bodies, as clay-slate. In this sense it means the tendency of rocks to split along planes which either coincide with the original plane of stratification or may cross it at any angle up to a right angle. This tendency is the consequence of the readjustment by pressure and heat of the components of rocks, one of the phases of metamorphism.

CLECKHEATON, a town of England, county York, West Riding, pleasantly situated on a declivity in the Spen valley, 10 miles w. Leeds. It is well built, lighted with gas, and has a technical institution, handsome premises belonging to the co-operative association, a fine town-hall (opened 1892), and three large and beautiful chapels. The industries include the worsted and machine-card trades, machine making, engineering works, &c., and coal is mined in the neighbourhood. Pop. (1891), 11,826; (1901), 12,523.

CLEEF.—1. JOOST VAN, called Zotte (crazy) Cleef, born at Antwerp towards the end of the fifteenth century, was one of the most celebrated painters of his time, and in regard to beauty of colouring may challenge comparison with the most distinguished Italian masters. His excessive vanity and eccentricity caused him to be described as 'mad'.——2. JAN VAN, a painter, born at Venloo, Guelderland, in 1646, was a pupil of De Craeyer, and belongs to the Flemish school, of which he is one of the most eminent masters. His works, which resemble those of Poussin, are particularly remarkable for beauty of design and colouring. He died at Ghent in 1716. The churches of Ghent are adorned with many of his paintings, in which the heads of children and the female countenances are very beautiful.

CLEF (French for *key*), in music, a sign placed on a staff, in order to determine the pitch of the notes written on the staff. There are three clefs now in use: the *treble* or G clef, written on the second line; the *mean* or C clef, which may be placed on the first, third, or fourth lines; and the *bass* or F clef, seated on the fourth line. The mean clef is very seldom used in writing vocal music in England; the music for the inner parts, the *alto* and *tenor*, is generally placed on the treble clef, the tenor singing the notes an octave lower than they are written. See MUSIC.

CLEMATIS, a genus of climbing plants of the order Ranunculaceæ, comprehending a great number of species, all remarkable for the beauty of their flowers and foliage. The most common species, *C. Vitalba*, or traveller's joy, is a frequent ornament of the hedges both of England and the south of Scotland, where it becomes conspicuous, first by its copious clusters of white blossoms, and afterwards by its feather-tailed silky tufts. Among the exotic species in greatest favour with horticulturists are *C. flammula*, which produces abundant panicles of small white flowers, and is so odoriferous that it fills the air to a considerable distance around it with the sweetest fragrance; *C. cirrhosa*, remarkable for its large greenish-white flowers; and *C. Viticella*, with its festooning branches adorned with pink or purple bells. The common clematis contains a very acrid principle which taken into the stomach produces the effect of a corrosive poison. Its fresh leaves, piled together and applied to the skin, act like blisters. They are said to have been used in this way at an early period by begging impostors, who, to excite commiseration, covered their limbs with superficial and easily-cured ulcers. It is hence sometimes known by the name of beggar's herb. All the species of clematis grow freely in any light soil, and are greatly esteemed for trellis-work, and for training against walls. They may be propagated by layers, young cuttings, or seeds.

CLEMENCE ISAURE, a purely mythical personage, said to have been born in 1464, near Toulouse, and to have lost her father when she was five years old. She was educated in solitude, and grew up beautiful and talented. Near to her garden dwelt a young troubadour named Raoul, who became enamoured of her, and communicated his passion in songs. The maiden replied, not with words, but with flowers, and Raoul could well intrepret their meaning. He was the natural son of Count Raymond of Toulouse, and followed his father to the war against the Emperor Maximilian. In the battle of Guinegatte both were slain, and Clemence resolved to take the veil. Before doing so, in 1490, she renewed an old poetic festival, gave it the name of *jeux floraux* (which see), and assigned as prizes for the victors the five flowers used in replying to her lover. These games were under the patronage of the Blessed Virgin, who was described in the poems connected with them in the fifteenth century as Dama Clemenssa, that is, Merciful Lady, but in the next century there arose the false notion that they were concerned with a Dame Clemence. The name Isaure first appears about 1550.

CLEMENT, the name assumed by many popes. Of these, *Clement XIV.*, who abolished the order of Jesuits, was perhaps the most distinguished. Elected in 1769 he died in 1774, hated by a considerable party in the church.

CLEMENT, properly TITUS FLAVIUS CLEMENS, probably a native of Athens, but on account of the place of his residence commonly called *the Alexandrian*, was one of the most famous teachers of the Christian church in the second and at the beginning of the third century. He had been a heathen philosopher, was converted to Christianity, and after travelling a long time in Greece, Italy, and the East, became presbyter of the church of Alexandria, and teacher (*catechetes*) of the school in that city, in which place he succeeded Pantænus, his teacher, and was succeeded by Origen, his pupil. These three instructors increased the fame of the Alexandrian school in the second and third centuries. Clement was a fertile writer. The most important among those of his productions which have been handed down to us are inscribed Protreptikos, Paidagōgos, and Strōmateis or

Stromata. The first is an exhortation to the heathens to embrace Christianity, the second an exposition of Christian morals, and the third, which exhibits the most varied erudition, has the title Carpets, on account of the variety of subjects, moral, metaphysical, theological, historical, which are here interwoven. It has been justly remarked that these works are an imitation of the degrees of the Greek mysteries. The works of Clement are of great importance, as enabling us to judge of the state of science in his time, and because they contain fragments and accounts of lost works of antiquity. Clement introduced the eclectic philosophy into Christianity, and promoted the allegorical and mystical explanation of the sacred writings. The philosophy and erudition which gained him the admiration of his time, but also seduced him at times into singular speculations, caused him at a later period to be considered a heretic, and to lose with the orthodox the name of *saint* which had been conferred on him. The first editions of his works are that at Florence in 1550, and that at Heidelberg, 1592, by Frederick Sylburg, both in folio. The most complete is that of W. Dindorf, Clarendon Press, Oxford, 1869, 4 vols. There is an English translation.

CLEMENT, Jacques, born in 1567, at Serbonnes, in the diocese of Sens, became a Dominican, and has acquired a place in history as the fanatical tool of the Dukes of Mayenne and Aumale, and the Duchess Montpensier, in the murder of the French King Henry III. (which see). On stabbing the king he was killed by some of the courtiers, and his body having been dragged to the place of execution, was torn asunder by horses. The populace, however, instigated by the priests, regarded him as a martyr; and even Pope Sixtus V. was not ashamed to pronounce his panegyric before the conclave of cardinals, and compare him with Judith and Eleazer.

CLEMENTI, Muzio, a distinguished performer on the piano-forte, was born in Rome, in 1752. His father, a silversmith, was himself fond of music, and had his son instructed as well as his means allowed, young Clementi showing great talent and inclination for this art. Buroni, one of his relations, was his first master. In his seventh year an organist, Cordicelli, instructed him in thorough bass, and in his ninth year he passed an examination as an organist. He then received instruction from the famous singer Santarelli, and from Carpini, the celebrated contrapuntist. At this time, in his twelfth year, he wrote a mass for four voices, which was received with great applause. He had made such progress in his performance on the piano-forte that an Englishman, Mr. Beckford, was anxious to take him to England. The father at length consented, and young Clementi studied at the country seat of Mr. Beckford, in Dorsetshire, and soon made himself master of the English language. In his eighteenth year he far excelled all his contemporaries in skill and expression, and published his Opus II., which formed a new epoch in this species of composition. After leaving Dorsetshire he was engaged as director of the orchestra of the opera in London. His fame increased rapidly. In the year 1780 he went to Paris, where he was received with enthusiasm. From thence he proceeded, in the summer of 1781, to Vienna, where he became acquainted with Mozart and Haydn, and played before the Emperor Joseph II. with the former. He likewise published several compositions. In 1784 he repeated his visit to Paris, but after that remained in England till 1802. The loss which he sustained from the failure of a large commercial establishment induced him to give lessons in music for a time. In his leisure hours he occupied himself with playing on the piano-forte, and the improvement of this instrument. He had previously published his famous Introduction to the Art of Piano-forte Playing. In the year 1802 he went to Paris, for the third time, with his scholar Field; from thence to Vienna and to St. Petersburg, where Field remained. Clementi was universally admired. From St. Petersburg the pianist Zeuner followed him to Berlin and Dresden. From Dresden he was accompanied by Klengel, the organist, who was anxious to improve under his care. At Berlin Clementi married his second wife, whom he took with him into Italy, but lost on his return to Berlin. He then went anew to St. Petersburg, with the distinguished pianist and instructor Berger, and afterwards returned again to Vienna. In the following year family concerns carried him to Rome and Milan. In the summer of 1810 he ventured, notwithstanding the closing of the continental ports, to return to England, where he arrived safely, and married his third wife. In the meantime he continued to compose, and wrote some grand symphonies for the Philharmonic Society. One of his most valuable works is his Gradus ad Parnassum, which occupied him a long time. He likewise superintended the construction of instruments, and this business was very lucrative to him. He had one of the principal musical establishments in London, his instruments being highly esteemed. In 1820 he again went to the Continent, and remained at Leipzig till Easter in 1821, where two new symphonies of his were performed. He died on the 10th March, 1832, and was interred in Westminster Abbey.

CLEOBIS and BITON. Herodotus relates an affecting story of these two youths, the sons of Cydippe, chief-priestess of Hera (Juno) at Argos. At the *Heraia*, a feast in honour of Hera, it was customary for the chief-priestess to be drawn by two white oxen. On one occasion the procession had already begun to move, and the oxen had not arrived, upon which Cleobis and Biton drew the chariot of their mother for a distance of forty-five stadia, up the mountain where the Temple of Hera stood. The people applauded, and the mother was so affected by this instance of filial affection that she begged the goddess to grant her sons the best gift which could be conferred on mortals. While the youths were yet in the temple a soft sleep fell upon them, and they never awoke. The Argives placed the statues of Cleobis and Biton in the temple at Delphi, and in a temple at Argolis they were represented drawing the chariot of their mother.

CLEOBULUS, one of the *seven wise men*, as they were called; a native of Lindus, or, according to some, of Caria. He travelled to Egypt to learn wisdom, like many of the sages of Greece. He was King of Rhodes, and was succeeded on the throne by his daughter Cleobulina. Several of his sayings are extant. He flourished B.C. 560.

CLEOMBROTUS, son of Pausanias, king of Sparta. During his reign began the Theban war, in which he commanded the Spartans against Epaminondas and Pelopidas. He was killed in the battle of Leuctra, which happened July 8, 371 B.C., according to the Julian calendar. See Epaminondas.

CLEOMENES, the name of three kings of Sparta, the most distinguished of whom is Cleomenes III., king from 236 to 220 B.C. He intended to reform Sparta, and to restore the institutions of Lycurgus, after the example of Agis, his brother, who had lost his life in a similar attempt. Cleomenes distinguished himself in a war against the Achæans, commanded by Aratus. Returning to Sparta with a part of the army he put to death the ephori, made a new division of lands, and introduced again the old Spartan system of education, made his brother his colleague, and bestowed the full franchise upon many deserving persons who had not before had it. He lived very simply, was just and friendly towards everybody. He treated his enemies with generosity; for instance, the Achæans, who had begun a new war and were conquered. He showed himself an able general in a war against the Macedonians and Achæans united, but at last lost the important battle of Sellasia (B.C. 222). He fled to Egypt, where he was supported by Ptolemy Euergetes, but his son Ptolemy Philopator kept Cleomenes in confinement. Contriving to make their escape, they attempted to raise an insurrection against Ptolemy, but finding no supporters they killed each other. With Cleomenes expired the race of the Heraclidæ which had sat on the throne of Sparta.

CLEON, an Athenian demagogue of considerable note in the early part of the Peloponnesian war. He was a tanner by trade, but seems to have given up that occupation at an early date in order to devote himself to politics. He was well known in public before the death of Pericles, and his name is said to have been attached to the accusation which was brought against that general in the second year of the war. By the year 427 he was high in favour with the people, and distinguished himself by the atrocious proposal—which was adopted but afterwards rescinded—that all the adult males of the revolted Mytileneans should be put to death, and the women and children sold for slaves. In 425 he had the good fortune to take prisoners those Spartans who had been blockaded for some time by an Athenian force in the island of Sphacteria, on the west coast of the Peloponnesus. The next year he had to writhe under the lash of Aristophanes, who attacked him in his comedy of the Knights—as he did also in the Wasps in 422—satirizing his venality, rapacity, ignorance, violence, and cowardice. The portrait which the dramatist presents of Cleon can scarcely be regarded as literally true, but unfortunately it is too well supported from other sources to permit us to doubt of its correctness in the main. In 422 he was sent to Chalcidice against Brasidas, who was capturing the Athenian tributary cities there. Being quite ignorant of the art of war he allowed himself to be taken unawares by a sally of Brasidas and his troops from Amphipolis, and was slain while attempting to flee.

CLEOPATRA. Amongst several Egyptian princesses of this name, the most renowned was the eldest daughter of Ptolemy Auletes, wife to his eldest son Ptolemy, with whom she shared the throne of Egypt. Both were minors at the death of their father, and were placed under the guardianship of Pothinus and Achillas, who deprived Cleopatra of her share in the government (B.C. 49). She went to Syria, and was forming plans for obtaining her rights by force, when Cæsar came to Alexandria, and, captivated with her youthful charms, seconded her claims; and though the people of Alexandria were excited to a revolt by the arts of her brother, Cæsar succeeded in pacifying them, and procured Cleopatra her share of the throne. But Pothinus stirred up a second revolt, upon which the Alexandrian war commenced, in which the elder Ptolemy losing his life, Cæsar proclaimed Cleopatra queen of Egypt; but she was compelled to take her brother, the younger Ptolemy, who was only eleven years old, as her husband and colleague on the throne. Cæsar continued some time at Cleopatra's court, and had a son by her named Cæsarion, who was afterwards put to death by Augustus. After Cæsar's departure she governed undisturbed. She subsequently made a journey to Rome, where Cæsar received her magnificently, and erected a statue to her next to the statue of Venus, in the temple consecrated to that deity. This act, however, excited the displeasure of the people, and Cleopatra soon returned to her own dominions. When her brother, at the age of fourteen, demanded his share in the government Cleopatra poisoned him, and remained sole possessor of the regal power. During the civil war in Rome she took the part of the triumvirs, and after the battle of Philippi she sailed to join Antony at Tarsus. She was then twenty-five years old, and combined with extraordinary beauty great wit and the highest elegance of manners. She appeared in a magnificently decorated ship, under a golden canopy, arrayed as Venus, surrounded by beautiful boys and girls, who represented Cupids and Graces. Her meeting with Antony was attended by the most splendid festivals. After having accompanied him to Tyre she returned to Egypt. Antony followed her, and gave himself up to the most extravagant pleasures. She accompanied him on his march against the Parthians, and when he parted from her on the Euphrates he bestowed Cyrene, Cyprus, Cœlosyria, Phœnicia, Cilicia, and Crete on her, to which he added part of Judea and Arabia at her request. After this Antony conquered Armenia, returned triumphantly to Egypt, and made his three sons by Cleopatra, and also Cæsarion, kings. Now commenced the war between Augustus and Antony, but instead of acting promptly against his adversary, Antony lost a whole year in festivals and amusements with Cleopatra at Ephesus, Samos, and Athens, and at last determined to decide the contest by a naval battle. At Actium (which see) the fleets met. Cleopatra, who had brought Antony a reinforcement of sixty vessels, suddenly took to flight, and thus caused the defeat of her party; for Antony, as if under the influence of frenzy, immediately followed her. They fled to Egypt, and declared to Augustus that if Egypt were left to Cleopatra's children they would thenceforth live in retirement. But Augustus demanded Antony's death, and advanced towards Alexandria, which Antony hastened to defend. Cleopatra determined to burn herself with all her treasures, but Augustus pacified her by private messages. These communications, however, did not remain concealed from Antony, who, supposing Cleopatra treacherous, hastened to her, to avenge himself by her death. She, however, escaped, and took refuge in the mausoleum which she had erected near the Temple of Isis, and caused the report of her suicide to be circulated. Antony now threw himself upon his sword; but before he expired was informed that Cleopatra was still living, upon which he caused himself to be carried into her presence, and breathed his last in her arms. Augustus succeeded in getting Cleopatra into his power, who still hoped to subdue him by her charms; but her arts were unavailing, and becoming aware that her life was spared only that she might grace the conqueror's triumph, she determined to escape this ignominy by a voluntary death. She ordered a splendid feast to be prepared, desired her attendants to leave her, and put an asp, which a faithful servant had brought her, concealed amongst flowers, on her arm, the bite of which caused her death almost immediately (B.C. 30). Augustus, in his triumphal procession, had a portrait of the queen, with a serpent on her arm, carried before him. Her body was interred near that of Antony. At the time of her death she was thirty-nine years old, and had reigned twenty-two years.

CLEPSYDRA, or WATER-CLOCK, an instrument for the measurement of time by the escape of water from a vessel through an orifice. Its origin is extremely ancient, and has generally been attributed to the Egyptians. Two descriptions of clepsydræ have been employed—one in which the water merely escapes through the orifice, the other in which the same level is constantly maintained by the introduction of a fresh supply of water, and a uniformity of efflux secured by retaining throughout an equal amount of pressure on the fluid as it issues from the bottom of the vessel. In the plate at CLOCK an example of a water-clock is given, in which the measure of time is registered on a dial-plate by means of a hydraulic apparatus, acted on by the efflux of water from a cistern. These instruments are now scarcely ever constructed.

CLERESTORY, or CLEARSTORY, the upper part of the nave in Gothic churches, formed by walls supported on the arches of the nave, and rising above the roof of the side aisles. In these walls windows are inserted for the purpose of increasing the light in the nave.

CLERGY (from Greek *klēros*, a lot, through the Latin *clericus* and Low Latin *clericia*), the body of ecclesiastical persons, or persons performing religious functions, in contradistinction to the *laity*. The name was originally given in order to indicate that this class was to be considered as the particular inheritance and property of God—a metaphor taken from the Old Testament. The separation of the clergy and laity, at first not strongly marked, must have taken place at a very early period in the history of the church. As the church continued to prosper, the influence of its officers became more and more evident. They were not only reverenced as spiritual guides and the ministers of the sacraments, but formed also the best-educated portion of the community. They were accorded numerous privileges and exemptions: no bishop could be cited before a secular court, no priest could be subjected to question by torture, no lay tribunal could interfere in ecclesiastical affairs, and in many cases the clergy were exempted from the public taxation. In Germany the sovereignty of several states was vested in them, and the Bishop of Rome held the sway of a temporal prince combined with the spiritual lordship of the greater part of the civilized world. Latterly in almost every state of Europe arose struggles for privilege and power between the laity and clergy, but the latter were gradually stripped of their special privileges, as well as their wealth, and in most countries now there is comparatively little difference as regards civil rights between the layman and the ecclesiastic. In England, however, they have still some privileges. A clergyman cannot be compelled to serve as juryman, he is exempted from arrest while celebrating divine worship, from acting as bailiff, constable, or in any such capacity, or from attendance at a court leet; but, on the other hand, he cannot accept a seat in the House of Commons, engage in trade, or farm lands of more than eighty acres, unless with permission of his bishop. Three orders or grades of clergy are recognized by the Anglican, Roman Catholic, and other churches—bishops, priests, and deacons. Presbyterians and others, however, believe in the ministry of only one order. The clergyman, according to the doctrine of the Roman Catholic Church, is endowed in his spiritual character with a kind of supernatural power, which separates him essentially from the layman. Priests of the Roman Catholic and Greek churches who are not subject to the rules of any religious order are known as the *secular clergy*; the others constitute the *regular clergy*.

CLERGY, BENEFIT OF. See BENEFIT OF CLERGY.

CLERK, JOHN, of Eldin, near Edinburgh, a naval tactician, for whom is claimed the invention of the manœuvre of *breaking the enemy's line*, was born at Penicuik in 1728, and died in 1812. His Essay on Naval Tactics was privately printed, and Clerk, under the impression that a copy had been seen by Admiral Rodney, claimed a share in the latter's victory off Dominica. The first complete edition of the essay appeared in 1804. Clerk's method was adopted in some measure by Howe, Duncan, and Nelson, but the employment of steam in navigation has greatly changed the value of the system.

CLERK, PARISH, a lay officer of the Church of England, who may be appointed either by the incumbent or the parishioners. It is his duty to lead the responses and assist in the service of public worship and at funerals. There is generally only one in a parish, and his remuneration depends altogether on the custom of the place.

CLERK OF THE HOUSE OF COMMONS, an officer appointed by the crown, whose duty it is to make minutes of the decisions (not of the debates) of the house; to see that these minutes are correctly printed and handed to the members; to read aloud all such papers as the house may order to be read; and to act as president (without taking the chair) during the choice of a speaker. He has a salary of £2000.

CLERMONT-DE-LODÈVE, or CLERMONT L'HÉRAULT, a town of France, department of Hérault, 23 miles west by north of Montpellier. It is pleasantly situated on a hill crowned with the ruins of an old castle, and has a handsome Gothic church with a very lofty spire, and a communal college. The staple manufacture is woollen cloth. Pop. (1896), 4740.

CLERMONT-FERRAND (anciently *Augustonemetum*), a town of France, capital of department Puy-de-Dôme, between the Allier and Bedat, on a hill at the foot of the volcanic range in which the summit of the Puy is conspicuous. It was originally the capital of the Arverni, possessed considerable importance under the Romans, and became a bishop's see in 250. It was afterwards sacked by the northern hordes, but soon recovered, and was selected in 1095 for the meeting of the great council in which the Crusades originated. In 1556 it became the capital of the duchy of Auvergne. Among its natives are Gregory of Tours, Pascal, and General Dessaix. The modern town, overlooking the fertile plain of the Limagne, and encircled by planted boulevards, is built of lava from the neighbouring mountains, and is by no means prepossessing. Most of its streets are narrow, and very crooked and dirty. The most remarkable edifices are the Gothic cathedral, a huge, irregular, gloomy pile, begun in 1248, and recently completed by the construction of the west front and two towers; the Church of Notre Dame, founded in 580, and incrusted externally with rude mosaics; the town-house, court-house, theatre, general hospital, &c. There are also a medical and a theological college, technical schools, observatory, public library, botanic garden, and museums of natural history and antiquities. There is an electric street tramway system. The manufactures, more numerous than extensive, consist chiefly of chemicals, animal oils, table-linen, nails, hats, machinery, &c. It is an important centre of trade. Near it there are two mineral springs. Pop. (1896), 38,913.

CLERMONT-TONNERRE, the name of an ancient family of counts in Dauphiny, which has produced several distinguished historical personages. One of the most celebrated is Count Stanislas, born in 1757. At the breaking out of the revolution in 1789 he took his place in the states-general as deputy of the nobility. He possessed great abilities as a public speaker, and employed them in maintaining the doctrine of a constitutional monarchy. By this he incurred the displeasure equally of the aristocratic and of the republican parties. As a counterpoise to the influence of the Jacobins, he, in concert with Malouet and other friends of monarchy, founded the Monarchical Club; and along with Fontanes started the Journal des Impartiaux. The club having been denounced by Barnave as a band of conspirators, was dissolved, and the journal was suppressed after an existence of only two months. In 1791 he was arrested on the charge of having aided the king in his attempt to escape, but regained his liberty on taking an oath of fidelity to the national assembly. In 1792 he was dragged by a furious mob before the section. As no sufficient ground of detention appeared, he was dismissed, but was pursued and murdered.

CLEVELAND, a city and lake port of the United States, Ohio, capital of Cuyahoga county, on the south shore of Lake Erie, at the mouth of the Cuyahoga River. It is the second commercial city in the state, and has greatly increased of late years in population and importance. It is beautifully situated on an elevation above the lake, and for the most part handsomely laid out with wide streets, adorned with trees, and crossing each other at right angles. The harbour is spacious and good. Among its chief buildings are Cleveland Medical College, a music hall, the Northern Ohio Insane Asylum, Adelbert College for women, the Case School of Applied Sciences, the city hall, county court-house, &c. The free public library contains 67,000 volumes. The churches comprise, besides the buildings belonging to various Protestant denominations, ten synagogues, six convents, and a monastery. Cleveland is an important railway centre, has a very extensive lake traffic, and large manufactures, especially in iron and steel, including all kinds of machinery. The shipbuilding industry is of great importance. There are large coal-fields in the neighbourhood. Much of the prosperity of Cleveland is due to its position at the terminus of the Ohio Canal. Pop. in 1891, 261,353, of whom more than a third were Germans. Several suburbs are now included in the city, of which the most recently annexed (1893) are West Cleveland and Brooklyn. With these the total population in 1900 was 381,768.

CLEVES, German KLEVE, a town in Rhenish Prussia, 70 miles N.W. of Cologne, in a pleasant plain, 4½ miles from the Rhine, with which it is connected by a canal. It has manufactures of machinery, tobacco, leather, and cotton. In the centre of the town rises the old and renowned Schwanenburg (Swan's Castle), the ancient residence of the dukes of Cleves, founded, says tradition, by Julius Cæsar. The collegiate church, dating from the fourteenth century, contains monuments of the counts and dukes of Cleves, Cleves having been long a county and from 1417 a duchy. Prussia (Brandenburg) acquired Cleves in 1609. Pop. (1895), 10,936.

CLICHY-LA-GARENNE (Latin, *Cligiacum*), a town, France, department Seine, in a beautiful plain near the right bank of the Seine, and on the railway between Paris and St. Germain, about 4 miles N.W. Paris. It is a place of considerable antiquity; and in the seventh century, during the reign of Dagobert, who had a palace here to which he was particularly attached, was frequently the residence of the court. It contains a parish church, the erection of which is due to the celebrated Vincent de Paul, who was curate of Clichy in 1612; and has manufactures of white-lead, chemical products, glue, varnish, rolled lead, &c. Pop. (1896), 33,742.

CLIENTS, in ancient Rome, were citizens of the lower ranks who chose a patron from the higher classes, whose duty it was to assist them in legal cases, to take a paternal care of them, and to provide for their security. The clients, on the other hand, were obliged to portion the daughters of the patron if he had not sufficient fortune, to follow him to the wars, to ransom him if taken prisoner, and to vote for him if he was candidate for an office. If a client died without issue, and had made no will, his property fell to the patron. Clients and patrons were under mutual obligation not to accuse each other, not to bear witness against each other, and in general not to do one another any injury. This relation continued till the time of the emperors. It is certainly among the most interesting and curious which history mentions, and must be considered as one of the first attempts at a regular government—as the transition from a patriarchal state, in which family relations are predominant, to a well-developed political system, securing the rights and independence of the individual.—In modern times the word *client* is used for a party to a lawsuit who has put his cause into the hands of a lawyer.

CLIFFORD, the name of a very old English family, several members of which have played an important part in history. The founder of the family, WALTER, son of Richard Fitz-Ponce, a Norman baron, acquired the castle of Clifford, in Herefordshire, under Henry II., and hence took the name of Clifford. One of his descendants, ROBERT, was the first who sat in the House of Lords as Baron de Clifford, in the beginning of the fourteenth century. He was killed in the battle of Bannockburn. The eighth baron, THOMAS, and the ninth, JOHN, distinguished themselves as zealous Lancastrians in the wars of the Roses. The former fell in the battle of St. Alban's (1455), the latter in that of Towton (1461). He was the murderer of the young Earl of Rutland, son of the Duke of York, and brother of Edward IV. HENRY, the grandson of John, received the title of Earl of Cumberland in 1525.—GEORGE CLIFFORD the third Earl of Cumberland, grandson of the first earl, eminent both for his literary and military abilities, was born at Brougham Castle, in Westmoreland, in 1558. He studied at Trinity College, Cambridge. His attention at this period was principally directed to mathematics and navigation, in both which he became very proficient. In 1586 he took part in the trial of Queen Mary Stuart. The same year he sailed to the coast of South America, having under his command a small squadron, which sensibly annoyed the Portuguese trade in that part of the world. Two years afterwards he commanded a ship in the ever-memorable action with the 'Invincible Armada', and subsequently fitted out at his own expense no fewer than nine expeditions to the Western Islands and the Spanish main, in one of which he succeeded in capturing a valuable Plate ship. His skill in martial exercises and knightly accomplishments on shore was no less distinguished than his naval tactics; and Queen Elizabeth, with whom he was in great favour, not only appointed him her champion in the court tournaments, but employed him in the more serious task of reducing the headstrong Essex to obedience. He was made a Knight of the Garter in 1591. He died Oct. 30, 1605, in London. The title of Earl of Cumberland became extinct with his nephew Henry, in 1643. The male line of the Cliffords is at present represented by the baronial family, Clifford of Chudleigh. The first Baron Clifford of Chudleigh was THOMAS CLIFFORD, one of the members of the Cabal (which see), who was raised to this dignity in 1672. A descendant still holds the title.

CLIFTON, a suburb of Bristol situated within the city boundary, on the summit of lofty cliffs, whence its name. A fine suspension bridge 703 feet long here crosses the river Avon 245 feet above its bed, uniting the counties of Gloucester and Somerset. Clifton contains a number of elegant squares, terraces, crescents, and many handsome houses of freestone and limestone, from quarries in the vicinity. Clifton College, founded 1860 and incorporated 1877, is an important educational institution. It has neither trade nor manufactures. The extension of Bristol and the beauty of its scenery are the sole sources of its prosperity.

CLIMACTERIC (*annus climactericus*), a critical year or period in a man's age, wherein, according to astrologers, there is some notable alteration to happen in the body, and a person is exposed to great danger of death. The word comes from *klimaktēr*, the step of a ladder or stair. The first climacteric is, according to some, the seventh year; the others are multiples of the first, as 14, 21, &c.; 63 and 84 are called the grand climacterics, and the dangers attending these periods are supposed to be great. Some held, according to this doctrine, every seventh year a climacteric; others allowed this title only to the product of the multiplication of the climacterical space by an odd number, as 3, 5, 7, 9; others considered every ninth year as a climacteric. The idea of climacterics is very ancient.

CLIMATE. The ancients denoted by this name the spaces between the imaginary circles, parallel to the equator, drawn in such a manner over the surface of the earth that the longest day in each circle is half an hour longer than in the preceding. According to this division there were twenty-four climates from the equator, where the longest day is twelve hours, to the polar circle, where it is twenty-four hours. From the polar circle the longest day increases so rapidly that only one degree nearer the pole it is a month long. The *frigid zones*, so called, that is, the regions extending from the northern and southern polar circles to the corresponding poles, some geographers have divided again into six climates. We have learned from a more accurate acquaintance with different countries that heat or cold depends not merely on geographical latitude, but that local causes also produce great variations from the general rule, by which a region lying near the equator should always be warmer than one remote from it. By the word *climate*, therefore, we understand the character of the weather peculiar to every country, as respects heat and cold, humidity and dryness, and the alteration of the seasons. In general, however, geographical latitude is the principal circumstance to be taken into view in considering the climate of a country. The highest degree of heat is found under the equator, and the lowest, or the greatest degree of cold, under the poles. The temperature of the intermediate regions is various, according to their position and local circumstances. Under the line the heat is not uniform. Owing to the radiant power of sandy plains, and the absence of aqueous vapour in the atmosphere, the heat in the deserts of Africa, particularly on the western coast, also in Arabia and India, is excessive. In the mountainous regions of South America, on the contrary, it is very moderate. The greatest heat in Africa is estimated at 70° of Réaumur, or 189·5° of Fahrenheit. The greatest degree of cold at the poles cannot be determined, because no one has ever penetrated to them. The greatest altitude of the sun at noon, and the time of its continuance above the horizon, depends altogether on the latitude. Without regard to local circumstances, a country is warmer in proportion as the sun's altitude is greater and the day longer. The elevation of any region above the surface of the sea has likewise an important influence on the climate. It is roughly estimated that the thermometer falls 1° for every 100 yards of ascent. But the nature of the surface is not to be disregarded. The heat increases as the soil becomes cultivated. Thus, for the last thousand years Germany has been growing gradually warmer by the destruction of forests, the draining of lakes, and the drying up of bogs and marshes. A similar consequence of cultivation seems to be apparent in the cultivated parts of North America, particularly in the Atlantic states. The mass of minerals which composes the highest layer of a country has, without doubt, an influence on its temperature. Barren sands admit of a much more intense heat than loam. Meadow lands are not so warm in summer as the bare ground. The winds to which a country is most exposed by its situation have a great influence on the climate. If north and east winds blow frequently in any region it will be colder, the latitude being the same, than another which is often swept by milder breezes from the south and west. The influence of the wind on the temperature of a country is very apparent in regions on the sea-coast. The difference in the extremes of temperature is least within the tropics. The heat, which would be intolerable when the sun is in the zenith, is mitigated by the rainy season, which then commences. When the sun returns to the opposite half of the torrid zone, so that its rays become less vertical, the weather is delightful. Lima and Quito, in Peru, have the finest climate of any part of the earth. The variations in temperature are greater in the temperate zones, and increase as you approach the polar circles. The heat of the higher latitudes, especially about 59° and 60°, amounts, in July, to 75° or 80° of Fahrenheit, and is greater than that of countries 10° nearer the equator. In Greenland the heat in summer is so great that it melts the pitch on the vessels. At Tornea, in Lapland, where the sun's rays fall as obliquely at the summer solstice as they do in Germany at the equinox, the heat is sometimes equal to that of the torrid zone, because the sun is almost always above the horizon. Under the poles the climate is perhaps the most uniform. A greater degree of cold than any we are accustomed to seems to reign there perpetually. Even in midsummer, when the sun does not go down for a long time (at the poles not for six months), the ice never thaws. The immense masses of it which surround the poles feel no sensible effect from the oblique and feeble beams of the sun, and seem to increase in magnitude every year.

From the general division of America into lofty mountainous *plateaux* and very low plains, there results a contrast between two climates which, although of an extremely different nature, are in almost immediate proximity. Peru, the valley of Quito, and the city of Mexico, though situated between the tropics, owe to their elevation the general temperature of spring. They behold the *paramos*, or mountain ridges, covered with snow, which continues upon some of the summits almost the whole year, while, at the distance of a few leagues, an intense and often sickly degree of heat suffocates the inhabitants of the ports of Vera Cruz and of Guayaquil. These two climates produce each a different system of vegetation. The flora of the torrid zone forms a border to the fields and groves of Europe. Such a remarkable proximity as this cannot fail of frequently occasioning sudden changes, by the displacement of these two masses of air, so differently constituted—a general inconvenience, experienced over the whole of America. Everywhere, however, this continent is subject to a lower degree of heat than the same latitudes in the eastern portion of the earth. Its elevation alone explains this fact, as far as regards the mountainous region; but why, it may be asked, is the same thing true of the low tracts of the country? To this the great observer, Alexander Humboldt, makes the following reply: 'The comparative narrowness of this continent; its elongation towards the icy poles; the ocean, whose unbroken surface is swept by the trade-winds; the currents of extremely cold water which flow from the Straits of

Magellan to Peru; the numerous chains of mountains, abounding in the sources of rivers, and whose summits, covered with snow, rise far above the region of the clouds; the great number of immense rivers that, after innumerable curves, always tend to the most distant shores; deserts, but not of sand, and consequently less susceptible of being impregnated with heat; impenetrable forests, that spread over the plains of the equator, abounding in rivers, and which, in those parts of the country that are the farthest distant from mountains and from the ocean, give rise to enormous masses of water, which are either attracted by them, or are formed during the act of vegetation; all these causes produce, in the lower parts of America, a climate which, from its coolness and humidity, is singularly contrasted with that of Africa. To these causes alone must we ascribe that abundant vegetation, so vigorous and so rich in juices, and that thick and umbrageous foliage, which constitute the characteristic features of the new continent.' Assuming this explanation as sufficient for South America and Mexico, we shall add, with regard to North America, that it scarcely extends any distance into the torrid zone, but on the contrary stretches far into the frigid zone. Accordingly the column of frozen air attached to this continent is nowhere counterbalanced by a column of equatorial air. From this results an extension of the polar climate to the very confines of the tropics; and hence winter and summer struggle for the ascendency, and the seasons change with astonishing rapidity. From all this, however, the north-western portion of the United States is happily exempt; for, being placed beyond the reach of freezing winds, it enjoys a temperature analogous to its latitude. The greater or lesser extent of coast line a country possesses in proportion to its area has a decided influence on the climate. The almost unvarying temperature of the ocean equalizes in some degree the periodic distribution of heat among the different seasons of the year, and the proximity of a great mass of water moderates, by its action on the winds, the heat of summer and the cold of winter. Hence the more equable temperature of islands and coasts as compared with that of places far inland. Warsaw and Amsterdam are almost in the same latitude, but the mean annual temperature of the former is 46·48°, while it reaches at the latter 53·4° Fahr. The proximity of large masses of water involves also the presence of much aqueous vapour in the atmosphere. According to Prof. Tyndall aqueous vapour is more necessary to the plant life of England than clothing to its people. Remove this vapour for a single summer night from the region it overspreads and you would destroy every plant capable of being destroyed by a freezing temperature. The warmth of the fields would pour itself unrequited into space, and the sun would rise upon an island held fast in the iron grip of frost. The aqueous vapour constitues a local dam by which the temperature at the earth's surface is deepened. But the dam finally overflows, and we give to space all that we receive from the sun.

CLIMAX (Greek, *klimax*, a ladder or stairs) and ANTICLIMAX are rhetorical figures; in the former of which the ideas rise in degree; in the latter they sink.

CLIMBING PERCH (*Anabas scandens*), a fish indigenous to Asiatic waters, remarkable for its power of ascending the banks of dried-up streams and proceeding over dry land to some spot where its unfailing instinct tells it water is to be found. They have been found in considerable numbers at great distances from water, and are credited by some writers with the capability of climbing up the rough stem of the palm-tree in search of the water that lodges between the bases of the dead leaves and the stem; but this is now considered unworthy of belief. The fishermen of the Ganges, who live largely on these fishes, put them into an earthen vessel as soon as caught, where they can exist for about a week without water. On opening the head of this fish the structure is clearly seen which enables it to defy, apparently, all natural law. The pharyngeal bones (those supporting the orifice between the mouth and gullet) are much enlarged, and modified into a series of labyrinthine cells and duplications, so that they can retain a considerable quantity of water in the interstices, and prevent the gill membranes from becoming dry. In the work of Sir J. Emerson Tennent on Ceylon will be found some interesting information respecting this fish. Pl. II., fig. 7, at ICHTHYOLOGY.

CLINICAL MEDICINE (from the Greek *klinē*, a bed) teaches us to investigate, at the bedside of the sick, the true nature of diseases in the phenomena presented; to note their course and termination; and to study the effects of the various modes of treatment to which they are subjected. From this mode of study we learn the character of individual cases; theoretical study being competent to make us acquainted with species only. Clinical medicine demands, therefore, careful observation. It is, in fact, synonymous with experience. We are unacquainted with the method of clinical instruction in medicine which was followed by the Asclepiadæ, but we cannot help admiring the results of it as exhibited to us in the writings of Hippocrates, who augmented the stores of experience inherited from them by following in their steps. After his time medicine ceased to be the property of particular families, and the path of experience, by which it had been rendered so valuable, was soon deserted. The slow progress of anatomy and physiology, the constant study of the philosophy of Aristotle, and endless disputes respecting the nature of man, of diseases, and of remedies, occupied all the attention of physicians; and the wise method of observing and describing the diseases themselves fell into disuse. Hospitals, at their origin, served rather as means of displaying the benevolence of the early Christians than of perfecting the study of medicine. The school of Alexandria was so celebrated, according to Ammianus Marcellinus, that a careful attendance upon its lessons entitled the student to pursue the practice of medicine. Another old and very thriving, although less known institution, was situated at Nishapur, in Persia; and hospitals, even before the flourishing period of the Arabians, to whom the happy idea is commonly ascribed, were united with these medical institutions. The last school, founded by the Emperor Aurelian, and superintended by Greek physicians, spread the doctrines of Hippocrates through all the East. It was supported for several centuries, and in it, without doubt, Rhazes, Ali-Abbas, Avicenna, and the other celebrated Arabian physicians, were instructed. At the same time the celebrated John Mesue, of Damascus, was at the head of the hospital of Bagdad. Of the mode of instruction pursued there we know nothing; but we are inclined to form no very elevated opinion of the systems of an age which was devoted to all the dreams of Arabian polypharmacy. In truth, medicine shared the fate of all the other natural sciences in those barbarous ages. Men were little disposed to acquire, slowly and cautiously, the knowledge of disease at the bedside of the sick, in the manner of the Greek physicians. It appears probable that the foundation of universities led to a renewed attention to the study of medical science; and we find accordingly, that in Spain, even under the dominion of the Arabians, there were schools and hospitals for the instruction of young physicians at

Seville, Toledo, and Cordova. But even then clinical studies were almost wholly neglected. Instead of studying the history of diseases, the pupils occupied their time with the most unprofitable pursuits. Not much more advantageous were the journeys which were made for the same objects to Italy and France, in the eleventh and twelfth centuries. The schools of Paris and Montpellier were those principally resorted to; but in these the instruction consisted simply in lectures and endless commentaries upon the most obscure subjects; and even at the close of the fifteenth century, when the works of the Greek physicians began to be printed, men were still busied with verbal explanations and disputes. Two centuries elapsed before physicians returned to clinical studies and instructions. Among the renovators of this mode of studying medicine may be named, in Holland, William von Straten, Otho Heurnius, and the celebrated Sylvius, about the middle of the seventeenth century; and it is said that clinical instruction was given at the same period in the schools of Hamburg, Vienna, and Strasburg. Even Boerhaave, who succeeded Sylvius as clinical instructor at Leyden in 1714, has left us no journals of daily observation of disease, but only academic discourses upon the general principles of medicine. The influence of this celebrated school was first perceived at Edinburgh, and afterwards at Vienna—two schools which, in celebrity for clinical instruction, soon eclipsed their common mother, the school of Leyden. Cullen, one of the most celebrated teachers of practical medicine at Edinburgh, was too fond of fine-spun theories upon the condition of the diseased structures of the body, and the proximate causes of disease, ever to follow a uniform method in his lectures, and to adopt the entire history of disease, as observed at the bedside, as the basis of his system. From the account of what was effected in clinical medicine in Italy, Germany, and France, in the course of the eighteenth century, we may discover both the constantly increasing attention to this department of knowledge, and the difficulties with which such institutions are obliged to contend. The Vienna school, by means of the labours of Van Swieten, De Haen, and, still more, of Stoll and of Franck, became a model of clinical study, since public lectures were given in the hospitals, and the simplicity of Grecian medicine successfully inculcated. The practice and study of medicine in the hospitals in France was only an indirect mode of gaining public confidence, till the period of the general revival of science, and the erection of the French *École de Santé*. In that, for the first time, clinical instruction was expressly commanded. At the present day every good school has its establishment for clinical medicine connected with it; that is, an hospital in which diseases can be seen and studied by those attending it. In Germany, the empirical or experimental mode of studying medicine was early given up for the more scientific form of lectures; while in Britain and France the opposite extreme took place, and students were carried, as they sometimes are still, to the bedside of the sick, before they had been properly grounded in elementary studies.

CLINTON, SIR HENRY, a British general who served in the Hanoverian war, and was sent to America in 1775 with the rank of major-general, where he distinguished himself in the battle of Bunker Hill. He was soon after sent against New York and Charleston, but without success. In a second attempt on New York he entered the city, after having defeated the Americans on Long Island. Being appointed to the command of that station for the purpose of favouring the movements of General Burgoyne, his attempts were rendered ineffectual by the surrender of that general at Saratoga. In 1778 he succeeded Howe in the command of Philadelphia, which Washington obliged him to evacuate. In 1779 he obtained possession of Charleston. His connection with Arnold (see ARNOLD), his attempt to seduce the American troops by the offer of making up their arrears of pay, and his boast that there were more American royalists in the pay of the king than there were soldiers in the army of Washington, illustrate the system of corruption then adopted by the British generals in America. In 1782 Clinton returned to England, having been superseded by General Carleton. He died in 1795. His narrative of his conduct in America (1782), was answered by Lord Cornwallis; to whom Clinton replied in Observations on Lord Cornwallis' Answer (1783). He was also the author of Observations on Stedman's History of the American War (1784).

CLIO, daughter of Zeus and Mnemosyne; the muse of glory and history. Her attributes are, a wreath of laurel upon her head, a trumpet in her right hand, and a roll of papyrus in her left.

CLIPPER, the word used to designate a modern construction of large sailing vessel. The peculiarities of these vessels are, their long sharp bow, their greatest beam lying abaft the centre of the ship, and their depth of keel. The speed attained by the opium and slave traders had attracted the attention of naval architects generally, and the shipbuilders of Britain (notably those of Aberdeen and Liverpool) and of America vied with each other in producing vessels which, while preserving fair carrying capabilities, should, as a primary requisite, be fast sailers. In this they, to a remarkable extent, succeeded, and the feats of the Atlantic, Australian, and China clippers, some of which attained an average speed during the voyage of over 15 miles an hour, used to be a topic of great interest and excitement among those connected with shipping and ocean traffic. Owing to the improvements in steam-vessels, and the many advantages possessed by them over sailing vessels, clippers, as a special type of ship, are now little heard of.

CLITHEROE, a municipal and formerly a parl. borough, England, county Lancaster, 28 miles N.N.W. of Manchester, a station on the Lancashire and Yorkshire Railway, pleasantly situated on the east bank of the Ribble, near the foot of Pendle Hill, which here attains an elevation of over 1800 feet. The streets are well paved, and the supply of water ample. There is a free grammar-school, founded in 1554 by Queen Mary, and several libraries. The town until lately had not a very thriving appearance, but is now prospering, being the seat of some large cotton spinning and weaving establishments, paper manufactories, and other industrial works. In the neighbourhood are extensive beds of limestone, which is burned for manure and building. Clitheroe returned one member to the House of Commons previous to 1885. Pop. of mun. bor. in 1881, 10,176; in 1891, 10,828; in 1901, 11,414.

CLITUS, son of Dropis, and brother of Hellanice, the nurse of Alexander the Great. He was one of the generals of Philip and Alexander, and saved the life of the latter in the battle of the Granicus by cutting off the hand of Rhosaces, who had just lifted up his arm to kill Alexander. Notwithstanding this service, however, Alexander slew him in a fit of intoxication, on account of some irritating words. After the act was performed he was penetrated with the bitterest remorse.

CLIVE, ROBERT, Lord Clive and Baron of Plassey, was born in 1725 in Shropshire. He was sent to several schools but to little purpose, and was said by all his masters to be the most unlucky boy in their schools. His father obtained for him the place of a writer in the East India Company's service, and in his nineteenth year he went in that capacity to Madras. Two years after his arrival Madras surrendered to the French, but Clive succeeded in making his escape to the English post of Fort St. David, where he entered the military service. He took part in the unsuccessful attempt to capture Pondicherry in 1748. The peace of Aix-la-Chapelle enabled him to return for a short time to civil employment, but when the British thought proper to engage as auxiliaries in favour of a competitor to the reigning Rajah of Tanjore, Clive greatly distinguished himself in the attack on one of his forts named Devikota, and was soon after appointed commissary to the British troops. About this time M. Dupleix, taking part with a candidate for the subahdarship of the Deccan, succeeded in placing him on the throne on condition of raising Chunda Sahib to the nabobship of the Carnatic. The British espoused the cause of Mahomed Ali, second son of the nabob who had fallen in the battle of Ambur in 1749, and as their candidate was besieged in Trichinopoly by Chunda Sahib, they resolved on Clive's proposal to create a diversion by attacking Arcot, the capital of the Carnatic. In 1751 Clive led a small force against the fort, which he captured without encountering opposition. Very shortly afterwards a detachment of Chunda Sahib's troops appeared and laid siege to the fort, but the brilliant defence of Clive's force compelled them to retire. He pursued them and routed them at Arni, and not long afterwards inflicted a signal defeat at Caveripauk on a force which was intended to recapture Arcot. He then relieved Trichinopoly, and shortly afterwards reduced the forts of Covelong and Chingleput. Returning to Madras he married, and in 1753 sailed to England for the recovery of his health. A diamond-hilted sword was voted to him by the East India Company. His stay in England was not of long duration, and having returned to India in 1753 the government of Fort St. David (South Arcot, Madras) was conferred upon him, with the right of succession to that of Madras, and a lieutenant-colonel's commission in the king's service. After a successful attack on the pirate Angria, in conjunction with Admiral Watson, he repaired to Fort St. David, but was soon called to Madras to command the succours sent to Bengal, where the nabob Suraj-ud-Dowlah had attacked the British, destroyed their factories, taken Calcutta, and suffocated over 120 of his prisoners in the Black Hole. Colonel Clive proceeded to Calcutta, and, driving out the enemy, took possession of the city, and with a very inferior number of men entered the nabob's camp and seized his cannon, which alarmed him so much that he offered terms which were adjusted much to the advantage of the Company. The state of things rendering it impossible for this peace to last long, Colonel Clive formed the project of dethroning the nabob; and one of the nabob's officers named Meer Jaffier joined in this, on condition of succeeding to his master's dignity. A Hindu merchant named Omichund was engaged to carry on the correspondence between Jaffier and the British; but, after gaining the confidence of the English, he demanded a high sum for his services, or rather for his silence. Upon this two treaties (one written on red and the other on white paper) were drawn up, in one of which his demand was inserted, and both were signed; but the first only was shown to Omichund. The nabob, suspecting what was going forward, commanded Meer Jaffier to swear fidelity and join his army; and the famous battle of Plassey ensued (June 21st, 1757), in which Clive's force of 3000 put to flight the nabob and his army of more than 50,000. On the affair being decided, Omichund was informed that 'the red paper was a trick, and he was to have nothing'. The disappointment, it is said, drove him mad, but this seems doubtful. It should also be noticed that the signature of Admiral Watson, who was too honest to sign the paper, was a forgery (to which we are told he was a party). The new nabob, Meer Jaffier, who had come over at the close of the battle, and had presented Clive with £234,000, now wished to govern without the interference of the British; but three rebellions rising against him, he was obliged to solicit the aid of Clive, who was appointed governor of Bengal. Soon after a Dutch force arrived at Chinsura, on pretence of being sent to reinforce the garrisons belonging to the Dutch company. Suspecting that they were invited by the nabob to destroy the British power, Clive attacked them both by sea and land, captured all their ships, and drew up a treaty signed by the Dutch, who agreed to pay all expenses on the restitution of their property. He then again returned to England (1760), where his success was highly applauded; and in 1762 he was raised to the Irish peerage by the title of *Baron Clive of Plassey*. Two years later he was made a Knight of the Bath. He was also elected M.P. for Shrewsbury. He had not, however, been long in England before a disagreement took place between Meer Jaffier and Mr. Holwell, who then officiated as governor, which ended in transferring the nabobship from the former to his son-in-law, Meer Kasim, but in consequence of the shameful monopolies and usurpations of the British traders the new nabob declared the trade of the country free for all. It was in consequence resolved to depose him and restore Meer Jaffier, and after a temporary success he was obliged to take refuge with the Nabob of Oude. On the news of these commotions reaching Great Britain, the Company appointed Lord Clive president of Bengal, with the command of the troops there; and in July, 1764, he returned to India. Before his arrival Major Adams had defeated the Nabob of Oude, Suraj-ud-Dowlah, and obliged him to sue for peace, so that Lord Clive had only to settle terms of agreement with the country powers, which he did to the great advantage of the Company, who acquired the disposal of all the revenues of Bengal, Behar, and Orissa. He also reformed the civil service in Bengal, and restored discipline in the army. In 1767 he finally returned to England, being the chief contributor to the immense possessions of the East India Company. After his return severe attacks were made upon him for his conduct in India, and a parliamentary inquiry followed, which led to resolutions of censure in 1773. But when a motion was made in the House of Commons, 'that Lord Clive had abused the powers with which he was intrusted', it was rejected, and a resolution passed 'that Lord Clive had rendered great and meritorious services to his country'. From that time his broken health and the mental worry caused by the attacks upon him rendered him a prey to depression of spirits (from which, however, he had never been quite free), under the morbid influence of which he put an end to his life, at the age of fifty, on November 22nd, 1774.

Lord Clive was, generally speaking, of a reserved temper, and very silent; nevertheless, among his intimate friends he could be lively and pleasant. He was always self-directed and secret in his decisions, but inspired those under his command with the utmost confidence, owing to his great bravery and presence of mind. His talents, in fact, were as great as his political morality was disputable. He was a member of Parliament from 1760 to his death, but seldom spoke; though when roused he could display great eloquence. In private life he was kind and exceedingly liberal. He married the sister of the Astronomer-royal, Dr. Maskelyne, by whom he had two sons and three daughters.

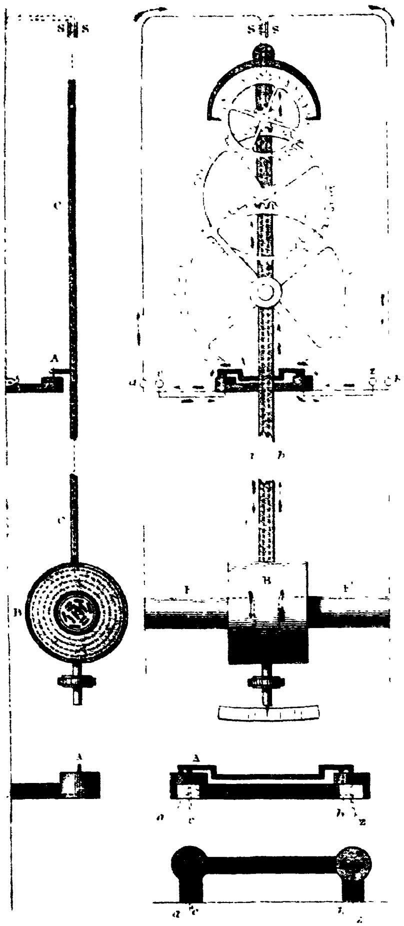
CLOACÆ, subterranean works in Rome, of stupendous size and strength, constructed in the time of the Tarquins, for conducting off the overflowings of the Tiber, the waters from the hill, and the filth of the city. The *cloaca maxima*, or principal branch, received numerous other branches between the Capitoline, Palatine, and Quirinal Hills. A portion of it still stands as firmly as on the day of its foundation 2500 years ago. It is formed of three concentric rows of enormous stones, piled above each other without cement. The height inside is 18 Roman palms (about 13 feet), and the width about the same.

CLOCK. For many inventions which do honour to the human mind we are indebted to the monks of the middle ages, who in their seclusion, free from the necessity of providing for their support, employed the time during which they were not engaged in their devotions in the practice of various arts, both useful and useless. Among the inventions which we owe to them are clocks, or time-keepers, which are set in motion by wheels, pendulums, and steel springs. The word *horologium* was in use even among the ancients; and it might almost be inferred from many expressions, that they possessed instruments similar to our pocket watches and chamber clocks. It is, however, certain that their time-pieces were sun-dials, hour-glasses, and clepsydræ. It was a clepsydra which Cassiodorus, in the sixth century, recommended to his monks, when a cloudy sky prevented them from observing their sun-dials. The gourmand Trimalchio, described by Petronius, had a clepsydra in his dining-room, and placed a trumpeter near it to announce the hours. Vitruvius mentions an Alexandrian artist who, 140 years before our era, combined spring-wheels with the clepsydra; but the account is too confused and incomplete to afford a correct idea of its construction. In an old chronicle it is related that Charlemagne received a clock from Haroun al Raschid in 809, to which small bells were attached, and in which figures of horsemen, at the hour of twelve, came forth through little doors and retired again. There is a more exact description of this work of art in the Franconian annals, attributed to Eginhard, in which it is particularly said to have been a clepsydra, and that at the end of each hour little balls of metal fell upon a bell and produced a sound. It is not probable that the clock which Pacificus, archdeacon of Verona, is said to have invented in the ninth century could have resembled our present clocks. The words on his tomb are so indistinct that nothing positive can be inferred from them. The discovery of clocks has likewise been attributed to the famous Gerbert of Auvergne, who afterwards became pope under the name of *Sylvester II.*, and died in 1003; but Ditmar of Merseburg, a trustworthy witness, only relates that Gerbert placed a *horologium* in Magdeburg for the Emperor Otho, after observing, through a tube, the star which guides the seamen. This must have been a sun-dial, which Gerbert placed according to the height of the pole. In the twelfth century clocks were made use of in the monasteries, which announced the end of every hour by the sound of a bell, put in motion by means of wheels. From this time forward the expression, 'the clock has struck,' is often met with. The hand for marking the time is also made mention of. Of William, abbot of Hirschau, his biographer relates that he invented a horologium similar to the celestial hemisphere. Short as this account is, it still appears probable that this abbot was the inventor of clocks, as he employed a person particularly in arranging his work and keeping it in order. This abbot died at the end of the eleventh century. In the thirteenth century there is again mention of a clock given by the Sultan Saladin to the Emperor Frederick II. This was evidently put in motion by weights and wheels. It not only marked the hours, but also the course of the sun, of the moon, and the planets in the zodiac. It is hardly probable that the Saracens learned the art of clock-making from the monks of European monasteries; perhaps, on the contrary, they were the real inventors of it, and the invention was made known to Europeans by means of the Crusades. In the fourteenth century there are stronger traces of the present system of clock-work. Dante particularly mentions clocks. Richard, abbot of St. Alban's in England, made a clock in 1326, such as had never been heard of till then. It not only indicated the course of the sun and moon, but also the ebb and flood tide. Large clocks on steeples likewise were first made use of in the fourteenth century. Perhaps Jac. Dondi, in Padua, was the first who made one of this kind; at least his family was called, after him, *Dell' Orologio*. A German, Henry von Wyck, was celebrated in the same century for a large clock which he placed in a tower built by command of Charles V., king of France. This clock was preserved till 1737.

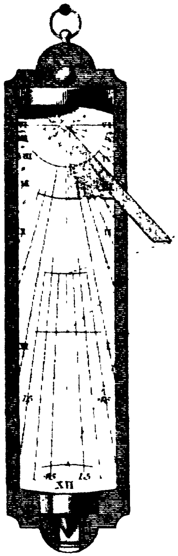
Watches are a much later invention, although they have likewise been said to have been invented as early as the fourteenth century. The general opinion is that they date from about 1477. (See WATCH.) One of their names was that of *Nuremberg eggs*. According to some accounts, the first trustworthy indications of their existence are found at the commencement of the seventeenth century. Galileo discovered the isochronism of the pendulum from observing the equal-timed vibrations of a lamp suspended from the ceiling of a church, and the simple pendulum was used by him as well as other astronomers of that day as a measure of time in their observations of the heavenly bodies. Huyghens was undoubtedly the first who applied the pendulum to clock-work, and the honour of being the inventor of the balance-spring in watches was contested between him and the English philosopher Dr. Hooke. To prevent friction, Facio, a Genevan, invented the method of boring holes in diamonds or rubies for the pivots to revolve in, which was found a great improvement. Thus chronometers had their origin, in which the English have attained great perfection. This nation also invented repeaters. An individual of the name of Barlow first made one, in 1676, for King Charles II.; and Graham was the inventor of the compensation-pendulum, in 1715. This was perfected by Harrison, who formed the pendulum of nine round rods, five of which were of iron and four of brass. With these pendulums the astronomical clocks are still provided, and perfect dependence may be placed in the regularity of their action. The country where watches are manufactured in the greatest numbers is French Switzerland, particularly at Geneva, La-Chaux-de-Fonds, Locle, &c., where they are made by thousands. Among French watchmakers, Berthoud, Breguet, Chevalier, Courvoisier, Prudhomme, and others, are distinguished. Britain, France, and America have been active in perfecting the art of horology. The elegant Parisian pendulum-clocks are well known, in which the art of the sculptor is combined with that of the machinist. Elegance, however, is their principal recommendation. It is much to be regretted that the present watches, unless the finest, have not the finish which gave such great durability to those of former times. This is particularly the case with French watches.

CLOCK.

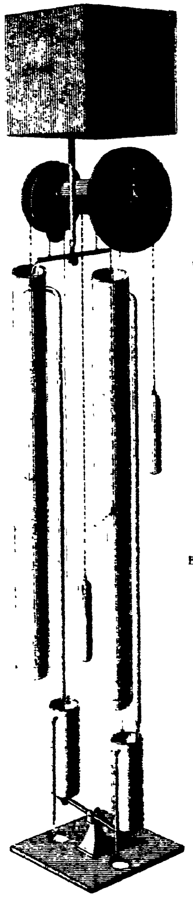
Electric Clock



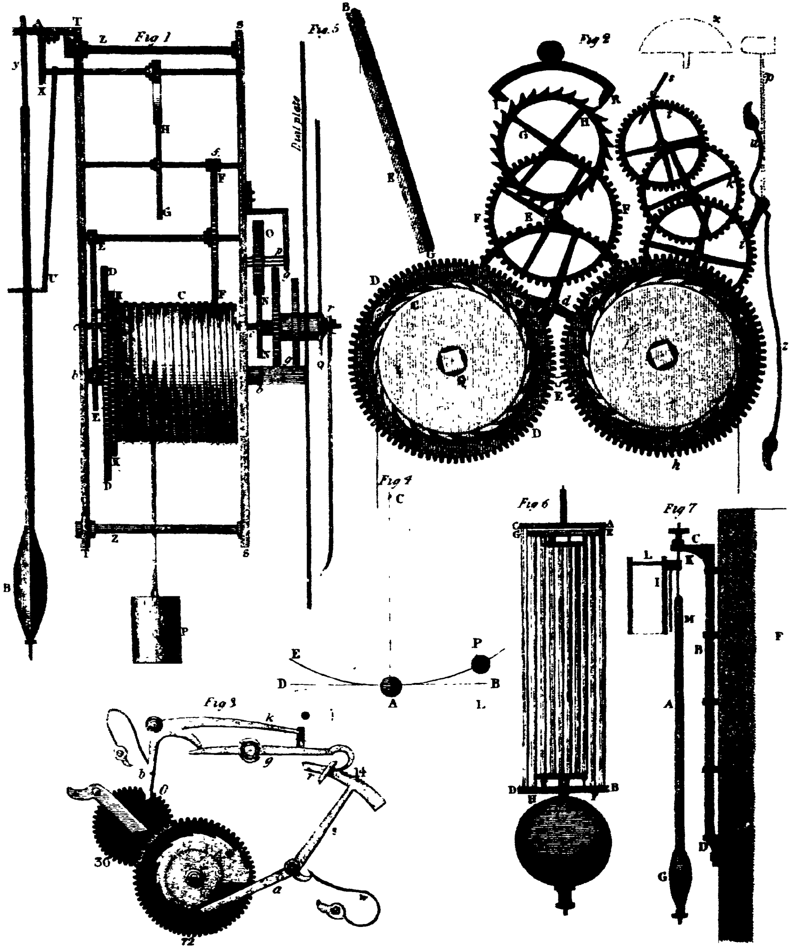
Sun Dial



Water Clock



Ordinary Clock movements and Pendulums



We speak here of the better sort of watches; the ordinary ones now made at such a cheap rate can hardly be expected to have much finish. Wooden clocks are largely made in the Schwarzwald, or Black Forest, in South Germany, where this manufacture was introduced in 1780, and they have also been made in great numbers in America, where the making of cheap clocks is an important industry. See also CLEPSYDRA, ELECTRIC CLOCK.

CLOCK-WORK. It is usual with writers on clock-work to consider the moving part, or that which measures the time, as independent of the striking department of a common clock; the first being called the *watch*, and the second the clock department. This method we shall follow, as it tends greatly to the simplification of the subject. An end view of the watch movement of a common clock is shown in the plate, fig. 1. The work-wheel is contained within two brass plates, SS.TT, connected together by four pillars, two of which are seen in the drawing. Between these two plates a barrel C is placed, moving on the pivots *b b* entering the plates, and which terminate the axis *a*, *a*. A catgut band passes round the barrel, being guided in winding by a spiral groove cut on the circumference. To the end of this catgut band, or cord, a weight P is attached, which, descending by its own weight, will uncoil the cord and cause the barrel to turn on its axis; and were no obstruction offered, this motion would continue until the catgut were exhausted or the weight reached the ground. This, however, is prevented by the action of a click fixed to the wheel DD, which click strikes against the right sides of the teeth of a ratchet-wheel attached to the barrel. The teeth of the wheel DD act upon the leaves of the pinion turning upon the pivots *c*, *c*. The wheel EE is fixed upon the axis of the pinion *d*, and thus the motion given to that pinion by the wheel DD is transferred to the wheel EE, from thence to the pinion *e*, and afterwards to the wheel FF, which again gives motion to the pinion *f*, upon the axis of which is fixed the swing-wheel GH. The swing-wheel, as will be seen in fig. 2, has teeth of the ratchet form, in which the pallets IR play. These pallets are connected by a cross piece, as seen in the drawing, which is fastened to an arbor going through the back plate of the frame, as seen in fig. 1, and carrying the lever XU, which has a forked end, to receive the pendulum. To the brass bar A screwed to the frame of the clock there is attached a small steel spring *y* by which the pendulum is suspended. The pendulum consists of a slender rod, with a heavy bob at the one end, being suspended at the other. The length of time which the pendulum takes to vibrate will depend on its length, that is, on the distance between the centre of suspension and the centre of gravity of the bob.

On the laws of the motion of pendulums, such remarks shall only be made here as are necessary for the illustration of the movement of clock-work. The length of a pendulum vibrating seconds at London has been found to be 39·1393 inches. This pendulum, although vibrating seconds at London, would not do so correctly in other latitudes, for it has been found by experiment, and may be demonstrated from the known laws of gravity, that the length of the seconds pendulum increases by a certain rate as we advance from the equator to the poles, the length at the equator being 39, and at the poles 39·206 inches. The latitude of the place where the clock is meant to go must therefore be taken into consideration by the maker, and the length of the pendulum regulated accordingly. The pendulum may be made to vibrate half-seconds, seconds, or two seconds, and the number of the teeth in the wheels made to correspond; but when a choice can be made, experience proves that preference ought to be given to a long pendulum. On this subject more shall be said towards the end of this article; meantime we return to the examination of the connection of the pendulum with the swing-wheel.—When the pendulum *y* B, fig. 1, is drawn a little aside from the perpendicular, and then let go, it will move backwards and forwards, the bob B describing the arc of a circle round the centre of suspension *y;* and from the connection before pointed out between the pendulum and the pallets, IR, fig. 2, it is easy to see that when, by the action of the weight P, motion is, as shown before, transmitted to the wheel GH, a tooth, H, of this wheel will act upon the pallet R, move it, and cause that tooth to escape. The motion of the pendulum will then cause the pallet I to come into contact with the tooth G, which again will escape, and so on, each tooth in the wheel escaping the pallets.—This department of the clock is denominated the escapement. Various forms of the escapement have been employed at different times, many of which exhibit great ingenuity; that which we have just described is the one in common use; it is very simple, and answers all ordinary purposes sufficiently well. In tracing the times of the revolutions of the wheels, we refer to fig. 1, where the wheel EE revolves once in an hour. The pivot *c* of this wheel passes through the plate, and is continued to *r*, upon which the minute hand, is fixed. This extremity *r*, which carries the minute hand, is the end of a long socket fastened into the centre of the wheel NN, the teeth of which act upon the wheel O, whose pinion *p* moves the wheel *gg* fixed upon the socket which turns with the wheel N. The hour hand is fixed upon the barrel of the wheel *gg*, which, of course, turns once round in twelve hours.

From this description the reader will perecive that the whole of the wheels, as likewise the pendulum, are kept in motion by the descending of the weight P, until the cord which is coiled round the barrel has been run out. The clock is again wound up by means of a key which fits on the square end of the arbor Q.

For the purpose of winding the clock, the click *c*, fig. 2, is moved by the inclined side of the teeth of the ratchet-wheel K, which turns with the barrel, while the wheel D is at rest, but it continues to move so soon as the cord is coiled upon the barrel—the click falls and checks the teeth, thus allowing the wheel D to move, the click being kept in the teeth of the wheel by means of the spring A. If the pendulum of the clock be a seconds pendulum, it will make 3600 vibrations in an hour; but a half-seconds pendulum, whose length is about $9\frac{78}{97}$ inches long, will make double that number, that is 7200 vibrations in an hour; and, supposing the latter to be employed, it then follows that, since the teeth of the swing-wheel GH must all act on each of the pallets, each tooth causing one vibration of the pendulum, if the swing-wheel have thirty teeth, the pendulum will make sixty vibrations during one of its revolutions. Hence, since sixty is contained in 7200 120 times, the wheel GH will turn 120 times in an hour. If the wheel E have seventy-two teeth, and the pinion six, then will the pinion revolve twelve times for one revolution of the wheel. The pinion C turns the wheel F, which has sixty teeth; and the pinion *e* making ten revolutions for one of the wheel F, makes 120; while E performs one. The pinion *f* moves GH, causing it to turn round and make the pendulum vibrate sixty times for every revolution; and as the pinion *f* turns the wheel G, the pendulum must make 60 × 120 or 7200 vibrations, while the wheel E makes one turn. This last wheel, then, turns once in an hour. The wheel N on the same axis must likewise turn in one hour, and the minute hand is fixed upon a tube on the axis of this wheel. This is fixed on pretty tight, so that the hand, being carried round by friction, may be moved so as to be set at any figure on the dial-plate without affecting any of the wheels. The wheel N, having thirty teeth, drives the wheel O, having the same number, which therefore revolves in an hour. O carries the pinion P of six leaves, acting upon the wheel *gg* of seventy-two teeth; and the pinion will therefore make twelve turns for one of the wheel *gg*, which must take twelve hours to revolve, and upon the axis of this accordingly the hour hand is fixed.

We have hitherto confined our attention to the going or watch part of the clock; we will now endeavour to explain the construction of the striking department. The prime mover of the striking department is a weight, attached to a cord wound round a barrel, in fig. 2, similar to the barrel in the clock department. The wheel *h* on this barrel turns a pinion of eight leaves, fixed on the same arbor as the wheel *i*, which again turns a pinion of eight leaves, on the arbor of the wheel *k*, of forty-eight teeth. On the same arbor with the wheel *t* of forty-eight teeth there is fixed a pinion driven by the wheel *k*, and the wheel *t* again drives another pinion of six leaves, on whose axis a broad flat piece of metal S is fixed, called the fly, which in revolving strikes the air, and the resistance thence arising retards the motion of the train. Eight pins project from the side of *i*, which, as the wheel turns round, act in succession on the tail of the hammer, causing it to move out from the bell. When a pin leaves the tail of the hammer, it is returned and made to strike the bell *x* by the action of the spring *z*. But to prevent the hammer from continuing to press upon the bell, and thus deaden the sound, a small spring, *u*, acts upon the hammer just before it strikes the bell, and lifts it after it has struck. The pin-wheel, *i*, carries a pinion of eight leaves, driven by the wheel *k*, of seventy-eight teeth, turning once in twelve hours. On the arbor of the wheel *k*, which passes through the brass plate SS, is fixed a small pinion of one tooth, called the gathering pallet, seen at *r*, fig. 3. The gathering pallet, which revolves once for each stroke of the hammer, turns a larger wheel, a segment of which is seen at *s*; this wheel is called the rack, and to it is attached the arm *b*, whose end rests upon the spiral plate *v*, called the snail, fixed on the same tubular arbor as the wheel seventy-two, and the hour hand. The snail is divided into twelve parts or steps, each of which corresponds to an hour; their circumferences are parts of circles struck to different radii, decreasing in a certain proportion each step, the length of each being one-twelfth part of the circumference of the circle on which it is struck. These circular arcs form so many slips, constituting the snail, against which the arm *b* of the rack is pressed by the spring *w*, which is opposed by the hawk's-bill *g*, a click acting on the teeth of the rack; *bk* is the warning-piece, being a three-armed detent, one arm of which is bent at the end, and passes through the plate SS, in order to catch a pin fixed in the arm of the wheel *t* (fig. 2). The other arm *b* takes a direction so as to meet a pin on the wheel O. In fig. 3 the parts are represented as in motion, and the motion would continue were it not that at each stroke of the hammer the gathering pallet *r* lifts the rack one tooth each turn—the hawk's-bill retaining the rack until a pin in the end of the rack is brought in the way of the gathering pallet lever, and thus stops the motion of the wheels. At the end of every hour the pin in the wheel O touches the end *b*, moving it towards the spring, thus lowering the end *k* to the circle of motion of the pin in the wheel *t* (fig. 2). The end of the hawk's-bill is at the same time lowered by the end of the short tail, in consequence of which the other end *g* is raised so as to clear the head of the rack S, when the rack is thrown back by the spring *w*, until the end of the arm A is pressed against the snail. The wheels are set in motion by the weight, when, by the falling back of the rack, the pin in it clears the gathering pallets; but a few minutes before the striking of the bell, the whole is stopped by the pin in the wheel *t* falling against the end *k*. The motion of the wheels during this action produces that noise called the warning of the clock. When the hammer is about to strike at the end of the hour, the end of the arm *b* of the wheel O slips over its pin, and it is raised against the end *k* by a small spring. The hammer *p* is raised by the pin-wheel *i*, and the bell is struck. The gathering pallet takes up a tooth of the rack each turn, the hawk's-bill retaining it until the pin of the rack comes under the gathering pallet, and checks the motion of the striking department until the next hour. The number of teeth that the rack falls back will depend upon the number of strokes made by the hammer, and from the form of the snail the rack falls back differently every hour, the hammer making one additional stroke each hour, from one to twelve. If, by any cord or other communication, the arm *b* should be moved between any two hours, then will the striking part be put into motion, and the arm A remaining in the step of the snail, the last hour will be struck, which is called repeating.

From this description it is easy to see that a clock may be made to go for any length of time without winding up, by increasing the number of teeth in the wheels, or, what comes to the same end, diminishing the number of hours in the pinions. The same may also be effected either by lengthening the cord to which the weight is attacked, or by increasing the number of wheels and pinions. The moving power in clocks with short pendulums, called time-pieces, is frequently not a weight, as is above described, but a spring, such as that employed in watches, for a description of which apparatus see WATCH. Many other appendages and peculiarities in the construction of escapements and other parts of clocks might have been described, but such minute detail would be totally inconsistent with the nature of a Popular Encyclopædia. We cannot, however, conclude this article without a more particular description of the pendulum, on which depends the regularity of the clock's motion. A heavy body *p* (fig. 4) attached to the end of a cord or slender rod PC, capable of moving round the centre C, forms the common pendulum. The body or bob P will, if undisturbed, remain in the lower point A of the arc PE, but if drawn to one side, as shown in the figure, and then let go, it will, by the action of gravity, have a tendency to fall to the centre of the earth, in the direction of PL; but because of the rod or cord PC, it describes the arc PA, being part of a circle of which C is the centre. When the bob has reached the lowest point A it has acquired such velocity as to carry it on to the point E, from which it descends and rises again towards A. These alternate motions backwards and forwards continue; but by reason of friction and the resistance of the air, the length of the arcs described by the bob will continually decrease until the action of gravity causes the pendulum to cease its motion altogether. We have already seen how the stopping of the pendulum is prevented from a new impulse being given at every vibration by the action of the teeth of the swing-wheel upon the pallets. It may be demonstrated that if two pendulums describe similar arcs, the times of their vibrations are as the square roots of the lengths of the pendulums, and also that the lengths of pendulums are as the squares of the number of their vibrations in equal times, or as the squares of the times of vibration. Wherefore, since the length of a seconds pendulum at London has been found to be 39·1386 inches (which will answer sufficiently well for all places in Britain), it follows, from the foregoing statement, that the length of a half-seconds pendulum will be about 9·8, and a quarter-seconds about 2·45 inches. The bob may be dispensed with, and a simple rod BG (fig. 5) employed, whose length is greater by one-third than the length of the pendulum with the bob.

We have before alluded to the effect of gravity in causing a difference in the time of vibration of the same pendulum in different latitudes, a circumstance which will be fully considered in the article PENDULUM; but there is another circumstance affecting the time of vibration of a pendulum which we must here consider—we mean the effect of heat and cold in lengthening and shortening the pendulum; so that the time of the going of a clock is influenced by variations of temperature. This circumstance for a long time rendered the clock a very unsafe guide to the navigator in determining the longitude, and accordingly several contrivances have been made to remedy this defect. Many of these are exceedingly ingenious, but our limits will only permit us to notice three. These pendulums are called compensation pendulums, because they contain within themselves means of compensating for variations in length caused by the differences of temperature. The first we shall notice is the mercurial pendulum of Graham, invented about 1721, which is exceedingly simple, and serves well to illustrate the principle upon which compensation pendulums are constructed. Graham's pendulum consists of a steel rod, at the end of which is fixed a glass jar containing mercury; so that when the rod expands by heat the jar is lowered, while at the same time the heat expands the mercury, and thus the centre of oscillation is raised, and the one expansion counteracting and compensating for the other, the length of the pendulum remains unchanged. This contrivance, though simple and ingenious, is in little use, being exceedingly difficult of adjustment. The gridiron pendulum of Harrison consists of five, seven, nine, or any odd number of rods of different metals which effect compensation in a manner that will be understood by reference to the pendulum represented in fig. 6. The two outer rods A B, C D, are of steel, fastened by means of pins to the cross pieces A C, B D. The rods E F, G H, are of brass, and fastened in a similar way to the lower bar B D, and to E G, the second bar from the top. The two next rods are of steel, and fastened to the cross-bars I K and E G. The next two are fastened to the cross-bar L M and I K, and are of brass. The central rod, to which the bob is attached, is made of steel, and fastened to the cross piece L M, and passes freely through the cross pieces B D, I K. The effect of the steel rods is to lengthen the pendulum on expansion by heat, or to shorten it on contraction by cold; while this is compensated by the contra expansion and contraction of the rods of brass in the following manner:—When, by increase of temperature, the two outer steel rods expand, the cross-bar B D, together with the rods attached to it, will descend, and thus the pendulum will be lengthened; but the two next brass rods fastened in B D will also expand and raise the cross piece E G, whereby the next two rods of steel will likewise be raised. These two last-mentioned rods will also expand, and therefore the cross piece I K will be lowered. To this cross piece the two next rods of brass are fastened, and they will likewise expand and raise the cross piece L M, which elevation will compensate for the depression of the bob by the expansion of the centre-rod. This description of pendulum answers the purpose of keeping correct time exceedingly well, and is accordingly employed where accuracy is essential, as in the clocks of observatories. The last form of the compensation pendulum which we shall notice is that of Crosthwaite. A and B are two rods made of steel similar to each other in every respect, the rod B being supported by a bracket D, and the top formed into a gibbet at C. The rod B is firmly fixed into a large piece of marble F, set into a wall so adjusted that the rod may be moved up or down between the brass staples 1, 2, 3, 4, which touch only in a point in front and behind. The rod A carries at its lower extremity the bob G, 24 lbs. weight, the upper end being suspended by a spring at the gibbet C. All this apparatus is unconnected with the clock, to the back of the plate of which at K two cheeks are secured in a line with the verge L. The maintaining power is applied in the usual way of regulators at M by means of a cylindrical stud, and here the compensation, if so it can be called, takes place. For while the rod B expands, A must raise the upper end C, the lower end being immovable, but its expansion will be accompanied with a similar expansion of the rod A, which will lower the bob. It is to be observed that the top of the rod A is attached to the gibbet by means of two slender chains which pass through between two brass plates, whose lower edges will form the centre of suspension of the pendulum. This pendulum, though much more simple, is not so invariable as a well-constructed pendulum of the gridiron construction.

CLODIA, one of the three sisters of Publius Clodius Pulcher, celebrated equally for her beauty and her profligacy, was married about 60 B.C. to C. Metellus Celer, who died the following year, probably from poison. Cicero having rejected her advances, she conceived a mortal hatred against him, and, in concert with her brother, used every possible means to effect his ruin. On her accusing M. Cælius Rufus of an attempt to poison her, Cicero undertook his defence, and has stamped her with infamy by the strong colours in which he depicted her dissolute life in a speech which is still extant. She was surnamed *Quadrantaria* (from *quadrans*, the fourth of an as), in allusion to her profligacy. Her two sisters were equally abandoned.

CLODIUS PULCHER, PUBLIUS, of the patrician family of the Claudii, son of Appius Claudius Pulcher, who was consul about 79 B.C. In the third Mithridatic war he served, with his brother Appius, under Lucullus; but not acquiring all the distinction he expected, stirred up the army against his commander. He then betook himself to his brother-in-law Quintus Marcius Rex, proconsul of Cilicia. Having been intrusted by him with the command of the fleet, he fell into the hands of pirates; but obtained his liberty and proceeded to Syria, where he excited disturbances which had well nigh cost him his life. He returned to Rome about 65 B.C., and in the following year accompanied the proprætor Lucius Muræna to Gaul, where he enriched himself by the most scandalous means. He is said, though apparently on insufficient ground, to have been implicated in Catiline's conspiracy, and continued to be a ringleader in almost all the seditions of the time, till an encounter with Titus Annius Milo put an end to his life. The celebrated speech of Cicero in defence of Milo has saved the name of Clodius from the oblivion into which it must otherwise have deservedly fallen. See CICERO.

CLOISTER. See MONASTERY.

CLONMEL, a town, Ireland, till 1898 partly in Waterford, but now all in Tipperary, in a beautiful valley, watered by the Suir and inclosed by mountains, 90 miles s.w. of Dublin. It consists of two distinct portions, on opposite sides of the river, and communicating by three stone bridges; and has three spacious principal and several other good streets, well paved and well lighted. The chief edifices are an Episcopal church, two Roman Catholic churches, a Franciscan abbey, the court-house, gaol, barracks, free library, town-hall, convents, schools, lunatic asylum, &c. The trade is chiefly in corn, cattle, and provisions; and there are corn-mills, creameries, a brewery, &c. Clonmel sent a member to Parliament till 1885. The boundaries were greatly extended in 1895. Pop. (1891), 8480.

CLOOTS, John Baptist von, a Prussian baron well known during the revolutionary scenes in France under the appellation of *Anacharsis Cloots.* He was born at Cleves in 1755, and became possessed of a considerable fortune, which he partly dissipated through misconduct. The example of his uncle, Cornelius Pauw, who published several popular works, inspired him with an inclination to become an author. He travelled in different parts of Europe, and formed an acquaintance with many eminent individuals, among whom was the celebrated Edmund Burke; but the politics of that statesman did not suit the irregular and ardent disposition of Cloots, to whom the French revolution at length opened a career which he thought worthy of his ambition. The first work in which he distinguished himself was the ridiculous masquerade called the Embassy of the Human Race, partly contrived by the Duke de Liancourt. On the 19th of June, 1790, Cloots presented himself at the bar of the national assembly, accompanied by a considerable number of enthusiastic followers of various nationalities, English, German, Italian, Spanish; Arabia and Chaldea even finding representatives. He described himself as the orator of the human race, and demanded the right of confederation, which was granted him. At the bar of the assembly, April 21, 1792, he made a strange speech, in which he recommended a declaration of war against the King of Hungary and Bohemia, proposed that the assembly should form itself into a diet during a year, and finished by offering a patriotic gift of 12,000 livres. On the 12th of August he went to congratulate the legislative assembly on the occurrences of the preceding 10th, and offered to raise a Prussian legion, to be called the *Vandal Legion.* The 27th of the same month he advised the assembly to set a price on the heads of the King of Prussia and the Duke of Brunswick, praised the action of John J. Ankarstrœm, the assassin of the King of Sweden, and, among other absurd expressions, he said, 'My heart is French and my soul is *sansculotte.*' He displayed no less hatred to Christianity than to royalty. In September, 1792, he was nominated deputy from the department of the Oise to the national convention, in which he voted for the death of Louis XVI. 'in the name of the human race.' This madman, becoming an object of suspicion to Robespierre and his party, was arrested and condemned to death, March 24, 1794. He suffered with several others, and on his way to the guillotine he discoursed to his companions on materialism and the contempt of death. On the scaffold he begged the executioner to decapitate him the last, that he might have an opportunity for making some observations essential to the establishment of certain principles while the heads of the others were falling.

CLOSE-HAULED, in navigation, the general arrangement or trim of a ship's sails when she endeavours to make progress in the nearest direction possible towards that point of the compass from which the wind blows.

CLOSE TIME, a period of the year during which certain animals are protected by law, and are not allowed to be caught or killed. Such animals are chiefly those that are killed for food or sport, and include birds, fishes, and quadrupeds, as well as certain others—crabs, lobsters, and oysters, for example. In the United Kingdom salmon, and game birds, such as grouse, partridge, and pheasant, are carefully protected in this way, and such protection has also been extended to wild birds.

CLOTH. See Cotton, Woollens, Silk, &c.

CLOTHING. A very striking fact, exhibited by the bills of mortality is the very large proportion of persons who die of consumption. In very many cases the origin of a consumption is an ordinary cold, and that cold is frequently taken through the want of a proper attention to clothing, particularly in females.

Nothing is more necessary to a comfortable state of existence than that the body should be kept in nearly a uniform temperature. The skin, by increase of the perspiration, carries off the excess of heat; the lungs, by decomposing the atmosphere, supply the loss; so that the internal parts of the body are preserved at a temperature of about 98° under all circumstances. In addition to the important share which the function of perspiration has in regulating the heat of the body, it serves the further purpose of an outlet to the constitution, by which it gets rid of matters that are no longer useful in its economy. The excretory function of the skin is of such paramount importance to health that we ought to direct our attention to the means of securing its being duly performed; for if the matters that ought to be thrown out of the body by the pores of the skin are retained, they invariably prove injurious. When speaking of the excrementitious matter of the skin we do not mean the sensible moisture which is poured out in hot weather, or when the body is heated by exercise; but a matter which is too subtle for the senses to take cognizance of, which is continually passing off from every part of the body, and which has been called *insensible perspiration.* This insensible perspiration is the true excretion of the skin. A suppression of the insensible perspiration is a prevailing symptom in almost all diseases. It is the sole cause of many fevers. Very many chronic diseases have no other cause. In warm weather, and particularly in hot climates, the functions of the skin being prodigiously increased, all the consequences of interrupting them are proportionably dangerous. Besides the function of perspiration, the skin is an organ of absorption. It is also the part on which the organ of feeling or touch is distributed. The skin is supplied with glands, which provide an oily matter, that renders it almost impervious to water, and thus secures the evaporation of the sensible perspiration. Were this oily matter deficient, the skin would become sodden, as is the case when it has been removed—a fact to be observed in the hands of washerwomen, when it is destroyed by the solvent powers of the soap. The hair serves as so many capillary tubes to conduct the perspired fluid from the skin. The three powers of the skin, perspiration, absorption, and feeling, are so dependent on each other, that it is impossible for one to be deranged without the other two being also disordered. For if a man be exposed to a frosty atmosphere till his limbs become stiff and his skin insensible, the vessels that excite the perspiration and the absorbent vessels partake of the torpor that has seized on the nerves of feeling; nor will they regain their lost activity till the sensibility be completely restored. The danger of suddenly attempting to restore sensibility to frozen parts is well known. If the addition of warmth be not very gradual, the vitality of the part will be destroyed. This consideration of the functions of the skin will at once point out the necessity of an especial attention, in a fickle climate, to the subject of clothing. The chief end proposed by clothing ought to be protection from the cold; and it never can be too deeply impressed on the mind (especially of those who have the care of children), that a degree of cold amounting to shivering cannot be felt without injury to the health, and that the strongest constitution cannot resist the benumbing influence of a sensation of cold constantly present, even though it be so moderate as not to occasion immediate complaint, or to induce the sufferer to seek protection from it. This degree of cold often lays the foundation of the whole host of chronic diseases, foremost amongst which are found scrofula and consumption. Persons engaged in sedentary employments must be almost constantly under the influence of this degree of cold, unless the apartment in which they work is heated to a degree that subjects them, on leaving it, to all the dangers of a sudden transition, as it were, from summer to winter. The inactivity to which such persons are condemned, by weakening the body, renders it incapable of maintaining the degree of warmth necessary to comfort without additional clothing or fire. Under such circumstances, a sufficient quantity of clothing of a proper quality, with the apartment moderately warmed and well ventilated, ought to be preferred to any means of heating the air of the room so much as to render any increase of clothing unnecessary. To heat the air of an apartment much above the ordinary temperature of the atmosphere, we must shut out the external air; that of the close room becomes extremely rarefied and dry; which circumstances make it doubly dangerous to pass from it to the cold, raw, external air. But in leaving a moderately well warmed room, if properly clothed, the change is not felt.

The only kind of dress that can afford the protection required by the changes of temperature to which high northern climates are liable, is *woollen*. Those who would receive the advantage which the wearing of woollen is capable of affording, must wear it next the skin; for it is in this situation only that its health-preserving power can be felt. The great advantages of woollen cloth are briefly these:—the readiness with which it allows the escape of sweat through its texture; its power of preserving the sensation of warmth to the skin under all circumstances; the slowness with which it conducts heat; the softness, lightness, and pliancy of its texture. *Cotton cloth*, though it differs but little from linen, approaches nearer to the nature of woollen, and on that account must be esteemed as the next best substance of which clothing may be made. *Silk* is the next in point of excellence, but it is very inferior to cotton in every respect. *Linen* possesses the contrary of most of the properties enumerated as excellencies in woollen. It retains the matter of perspiration in its texture, and speedily becomes imbued with it; it gives an unpleasant sensation of cold to the skin; it is very readily saturated with moisture, and it conducts heat too rapidly.

There are several prevailing errors in the mode of adapting clothes to the figure of the body, particularly amongst females. Clothes should be so made as to allow the body the full exercise of all its motions. The neglect of this precaution is productive of more mischief than is generally believed. The misery and suffering arising from it begin while we are yet in the cradle. Girls have for a while the same chance as boys, in a freedom from bandages of all kinds; but as they approach to womanhood they are subjected to trammels in the form of stays. The bad consequences are not immediately obvious, but not the less certain on that account. The girl writhes and twists to avoid the pinching which must necessarily attend the commencement of wearing stays tightly laced. The posture in which she finds ease is the one in which she will constantly be, until at last she will not be comfortable in any other, even when she is freed from the pressure that originally obliged her to adopt it. In this way most of the deformities to which young people are subject originate, and, unfortunately, it is not often that they are perceived until they have become considerable, and have existed too long to admit of remedy.

CLOUD. The clouds are aqueous vapours, which hover at a considerable height above the surface of the earth. They differ from fogs only by their height, and less degree of transparency. The cause of the latter circumstance is the thinness of the atmosphere in its higher regions, where the particles of vapour become condensed. The varieties of clouds are numerous. Some cast a shade which covers the sky, and at times produces a considerable darkness; others resemble a light veil, and permit the rays of the sun and moon to pass through them. The evaporations which rise from seas, lakes, ponds, rivers, and, in fact, from the whole surface of the earth, ascend, on account of their elasticity and lightness, in the atmosphere, until the air becomes so cold and thin that they can rise no higher, but are condensed. Philosophers, however, are of very different opinions respecting the way in which the condensation and the whole formation of the clouds proceed. The theory generally held is that the water, after its ascent in the form of vapour, and before it takes the shape of clouds, exists in a gaseous state, not affecting the hygrometer, which is the reason why the air in the higher regions is always dry. The clouds are collections of small vesicles, in the transformation of which from the gaseous state it is believed that heat operates, in part at least, because clouds communicate a degree of heat to the body which they render damp. Another theory is that clouds are collections of precipitated bubbles, and differ by their negative electricity from fogs, the electricity of which is generally positive. If clouds and fogs lose their electricity, rain is produced. These explanations are, however, by no means perfectly satisfactory.

The change of winds contributes essentially to the formation of clouds and fogs. In countries where this change is small and infrequent, as between the tropics, these phenomena of humidity in the atmosphere must be comparatively rare, but, when they happen, the more violent, because a great quantity of vapour has had time to collect. The distance of the clouds from the surface of the earth is very different. Thin and light clouds are much higher than the highest mountains; thick and heavy clouds, on the contrary, touch low mountains, steeples, and even trees. The average height of the clouds is calculated to be 2½ miles. Their size is likewise very different. Some have been found occupying an extent of 20 square miles, and their thickness, in some cases, has been ascertained by travellers, who have ascended mountains, to be several thousand feet: others are very thin, and of small dimensions.

The natural history of clouds, not as respects their chemical structure, but their forms, their application to meteorology and a knowledge of the weather, has been well treated by Luke Howard, in his Essay on Clouds. He distributes clouds, in the first place, into three simple or primary forms, viz.:—1. The *cirrus* (see plate, fig. 1), so called from its resemblance to a lock of hair, and consisting of fibres which diverge in all directions. Clouds of this description float at a great height in the atmosphere, their elevation, according to Dalton, being from 3 to 5 miles above the earth's surface. 2. The *cumulus* or *heap* (fig. 2), deriving its name from the accumulation of clouds of which it is composed, and presenting generally the appearance of a hemispherical figure on a horizontal base. These clouds accompany and foretell fine weather, and are formed more especially in the hot days of summer, attaining their greatest size early in the afternoon, and gradually decreasing towards sunset. Great masses of *cumulus* during high winds, in the quarter of the heavens towards which the wind blows, indicate approaching calm and rain. If the *cumulus* does not disappear, but rises, a thunder-storm may be expected to follow during the night. 3. The *stratus* (fig. 3), so named from its spreading out uniformly in a horizontal layer, which receives all its augmentations of volume from below. It is likewise often called the *fall-cloud*, from its being generally formed by the sinking of vapour in the atmosphere. It belongs essentially to the night, and is frequently seen on calm summer evenings after sunset ascending from the lower to the higher grounds, and dispersing in the form of a cumulus at sunrise. These three primary forms of clouds when combined produce the following modifications, four in number:—1. The *cirro-cumulus* (fig. 4), composed of a collection of cirri, and spreading itself frequently over the sky in the form of beds of delicate snowflakes. From the circumstance of the small masses which compose this cloud lying often *asunder*, or separate from one another, it has sometimes received the designation of *sonder-cloud*. 2. The *cirro-stratus* or *wane-cloud* (fig. 5), so called from its being generally seen slowly sinking, and in a state of transformation; when seen in the distance, a collection of these clouds suggests the resemblance of a shoal of fish, and the sky, when thickly mottled with them, is called in popular language a *mackerel-back sky*. 3. The *cumulo-stratus* or *twain-cloud* (fig. 6), one of the grandest and most beautiful of clouds, and consisting of a collection of large fleecy clouds overhanging a flat stratum or base. 4. The *cumulo-cirro-stratus, nimbus*, or *rain-cloud* (fig. 7), recognizable, according to Mr. Howard, by its fibrous border and uniformly gray aspect. It presents one of the least attractive appearances among clouds, but it is only when the dark surface of this cloud forms its background that the splendid phenomenon of the rainbow is exhibited in perfection.

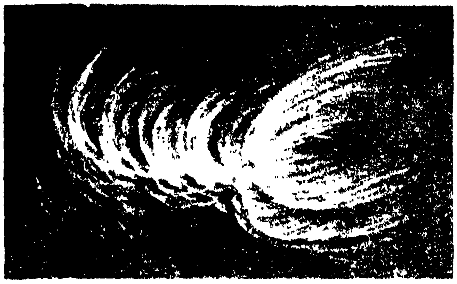
The clouds are generally assigned to three atmospheric regions, the upper, the middle, and the lower, to which a fourth, the lowest, may be added. To the upper region belongs the *cirrus*, which has the least density, but the greatest height and variety of shape and direction. The middle region is the seat of *cumulus*, which is generally the most condensed, and moves with the stream of air nearest to the earth. If the upper region, with its drying power, predominates, the upper parts of the *cumulus* become *cirrus*. But if the lower region predominates (into which the densest vapours are attracted and dissolved into drops), the basis of the *cumulus* sinks, and the cloud becomes *stratus*, the lower surface of which generally rests upon the earth or the water. Of the natural phenomena produced by the action of the clouds the *waterspout* (fig. 8) presents one of the most remarkable instances. This curious appearance is described under WHIRLWINDS.

CLOUD, ST., a town of France, in the department Seine-et-Oise, 6 miles s.w. from Paris, with which it has railway, steamboat, and tramway connection, is charmingly situated on the slope of a hill overlooking the river Seine. It is celebrated for its château and its magnificent park, a favourite holiday resort of the Parisians. The annual fair held here in September lasts three weeks, and is attended by multitudes from the capital. The park extends from the bank of the Seine about 10 miles to Garches, and is adorned with beautiful cascades and waterworks. As the residence of the monarchs of France, St. Cloud is historically interesting. In 1346 the town was burned by the English, and in 1411 by the Armagnacs. In the old mansion of St. Cloud Henry III. was murdered by Clément, August 2, 1589. This edifice and its splendid gardens were purchased by Louis XIV., who presented it to his brother, the Duke of Orleans. This prince enlarged and transformed it into a splendid palace, which became the residence of Henrietta, queen of Charles I. of England, from the time she quitted that country till her death. It afterwards belonged to Marie Antoinette. On the 18th Brumaire (1799) the representatives of the people, officially convoked in the orangery of St. Cloud, were dispersed by the grenadiers of Bonaparte, thus putting an end to the first revolution. Napoleon I. chose St. Cloud for his residence; hence the expression, *cabinet of St. Cloud*. Under the former government the phrase was *cabinet of Versailles*, or *cabinet of the Tuileries*. In 1815 Blucher had his head-quarters at St. Cloud; and here was concluded the military convention (July 3, 1815) by which Paris fell a second time into the hands of the allies. Here also, in July, 1830, Charles X. signed the ordonnances which led to the second revolution. The castle became the summer residence of Napoleon III., and in it he signed the declaration of war against Prussia (1870). During the siege of Paris the German outposts occupied the park of St. Cloud, and in their attempts to dislodge them the French gunners of Mont Valérien only succeeded in burning the imperial residences to the very walls. The town owes its origin to Clodoald, a grandson of Clovis, who founded a monastery here in 551. Pop. (1896), 5517.

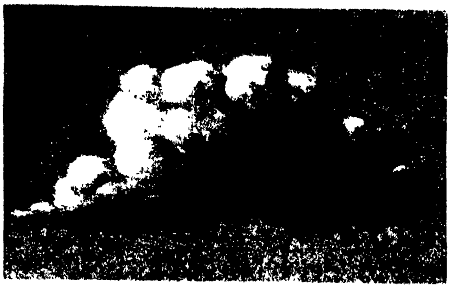
CLOUDBERRY (*Rubus Chamæmorus*), a fruit found plentifully in the north of Europe, Asia, and America, and belonging to the same genus as the raspberry and the bramble. It is so abundant in Lapland, Norway, and Sweden that it forms an article of extensive commerce, and it is also common in many elevated moory parts of the British Isles. The plant is small, with a rather large handsome leaf, indented and serrated at the edges. A single berry grows at the top of the stem, which is usually about eight or ten inches high. The fruit is of an orange-red colour, in shape resembles a raspberry, and the flavour is exceedingly fine. This plant has not yet been artificially cultivated with success, as it seems difficult of naturalization to any but its native soil and climate.

CLOUGH, ARTHUR HUGH, a poet of great promise, was born at Liverpool, 1st January, 1819. He studied under Dr. Arnold at Rugby, and then at Balliol College, Oxford, and became a fellow of Oriel College in 1842. In 1848 he visited Paris, and he spent the winter of the following year in Rome. In 1849 he became head of University Hall, London, but he resigned in 1852 and went to America. On his return next year he was appointed an examiner in the education office. After 1859 his health began to decline. A visit to the Continent in 1861 proved of no avail, and he died on 13th November of that year at Florence, of malarial fever, followed by paralysis. His poems were published, along with a genial memoir, by Mr. F. T. Palgrave in 1862; his poems and prose remains, with letters and a memoir, were also published by his wife in 1869 (2 vols.). The chief of his poems is entitled The Bothie of Tober-na-Vuolich (1848). They are masculine and vigorous in tone, and contain many noble

CLOUD. WATER-SPOUT.



1 Cirrus

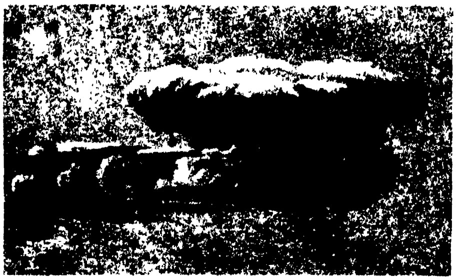


2 Cumulus

3 Stratus

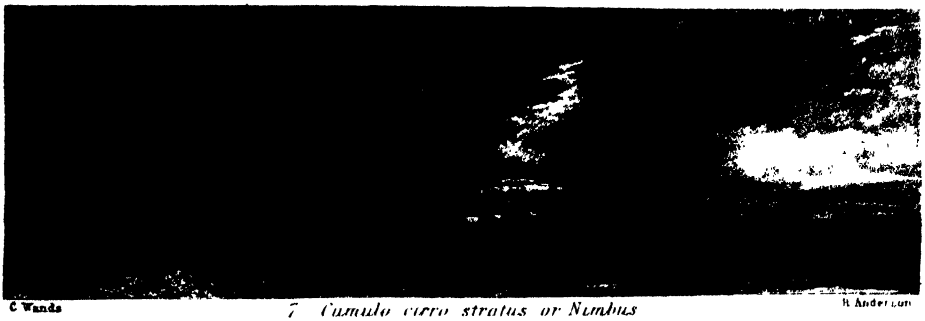
4 Cirro-cumulus

5 Cirro stratus



6 Cumulo stratus

8 Water spout



C Wands

7 Cumulo cirro stratus or Nimbus

R Anderson

thoughts, and strokes of genuine humour alternating with passages of deep pathos and tenderness.

CLOVE. The clove is the unexpanded flower-bud of an East Indian tree (*Caryophyllus aromaticus*), somewhat resembling the laurel in its height, and in the shape of its leaves. The flowers grow in clusters, and the petals are small, rounded, and of a bluish colour; the seed is an oval berry. The Molucca Islands, where the raising of different spices was formerly carried on by the Dutch colonists to a great extent, appear to be the native land of the clove, and the best are still brought from this quarter. At one time, however, in order to secure a lucrative branch of commerce in this article to themselves, the Dutch destroyed all the trees growing in other islands, and confined the propagation of them to that of Ternate. But both clove and nutmeg trees were transplanted from the Moluccas into the islands of Mauritius and Bourbon, and the clove is now cultivated with success in many warm countries, including Zanzibar and the West India islands. At a certain season of the year the clove-tree produces a vast profusion of flowers. The operation of gathering is performed betwixt the months of October and February, partly by the hand, partly by hooks, and partly by beating the trees with bamboos. The cloves are subsequently dried by exposure to the smoke of wood fires, afterwards to the rays of the sun. When first gathered they are of a reddish-colour, but by drying they assume a deep-brown cast. This spice yields a very fragrant odour, and has a bitterish, pungent, and warm taste. It is sometimes employed as a hot and stimulating medicine, but is more frequently used in culinary preparations. When fresh gathered, cloves will yield, on pressure, a fragrant, thick, and reddish oil; and by distillation a limpid essential oil.

CLOVE BARK, or CULILAWAN BARK, is furnished by a tree of the Molucca Islands (*Cinnamomum Culilawan*). It is in pieces more or less long, almost flat, thick, fibrous, covered with a white epidermis of a reddish-yellow inside, of a nutmeg and clove odour, and of an aromatic and sharp taste. It is one of the substitutes for cinnamon, but not much used. We find also, in commerce, under the name of *clove bark*, another bark furnished by the *Myrtus caryophyllata* (Linn.) It is in sticks 2 feet long, formed of several pieces of very thin and hard bark rolled up one over the other, of a deep brown colour, of a taste similar to that of cloves. It possesses the same properties as the former barks, and may be considered as a substitute for them.

CLOVER (*Trifolium*), a somewhat extensive genus of leguminous plants. Some botanists reckon no less than fifty-five species belonging to the genus of which cultivated clovers are varieties. The following are most used:—1. *T. pratense*, or common red clover. This is a biennial, and sometimes, especially on chalky soils, a triennial plant. This is the kind most commonly cultivated, as it yields a larger product than any of the other sorts. The soil best adapted for clover is a deep, sandy loam, which is favourable to its long tap-roots; but it will grow in any soil not too moist. So congenial is calcareous matter to clover, that the mere strewing of lime on some soils will call into action clover-seeds, which, it would appear, have lain dormant for ages. It is a recommendation of this grass that it is adapted to a soil suitable to scarcely any other kind of grass—to land which is dry, light, sandy, or composed mostly of gravel. Clover-seed should be sowed in the spring, except in climates where there are no severe winter frosts. The young plants which come up in autumn cannot bear the frost so well as those which have had a whole summer to bring them to maturity. Spring wheat is a very good crop with which to sow clover and other grass-seed. It is recommended to sow the grass-seed, and plough or harrow it in with the wheat. If it be scattered on the surface without being well covered, a part does not vegetate, and that which does will be liable to injury from drought. Clover-seed may also be sown in the spring on winter grain, and harrowed in. European writers agree with American cultivators that the harrowing will do no damage, but will be of service to the grain. The quantity sown may amount to 10 or 12 lbs. of clover-seed per acre, if the soil be rich, and double that quantity if it be poor. Clover-seed of a bright yellow, with a good quantity of purple and brown coloured seed amongst it, which shows its maturity, should be preferred. When perfectly ripe and well-gathered, its power of vegetation will continue for four or five years. Two sorts of machines are described in the Transactions of the New York Agricultural Society for gathering clover-seed. One of these machines consists of an open box about 4 feet square at the bottom, and about 3 feet in height on three sides; to the fore part, which is open, fingers are fixed, about 3 feet in length, and so near as to break off the heads from the clover stocks between them, which are thrown back as the box advances. The box is fixed on an axle-tree supported by small wheels, with handles fixed to the hinder part, by which the driver, while managing the horse, raises or depresses the fingers of the machine so as to take off the heads of the grass. The other machine, called a *cradle*, is made of an oak board about 18 inches in length and 10 in breadth. The fore part of it, to the length of 9 inches, is sawed into fingers; a handle is inserted behind inclined towards them, and a cloth put round the back part of the board, which is cut somewhat circular, and raised on the handle; this collects the heads or tops of the grass, and prevents them from scattering as they are struck off by the cradle, which may be made of different sizes—being smaller in proportion for women and children, who by means of it may likewise collect large quantities.—2. *Trifolium repens*, or white clover. This also thrives best in light land. When sown by itself it rarely grows tall enough to be well cut with a scythe. It is a most valuable plant for pasturage over the whole of Europe, Central Asia, and North America, and has also been introduced into South America. *T. hybridum*, Alsike, hybrid, or Swedish clover, has been long cultivated in the south of Sweden, and is strongly recommended for cold, moist, stiff soils. It resembles the common red clover in duration, stature, and mode of growth. The stems are hollow, not creeping, but disposed to spread unless sown close, when they will attain a height of 2 or even 3 feet. It has erroneously been said to last fifteen or twenty years, but that is only from the facility with which it sheds its seed and arises self-sown. *T. medium*, perennial red or meadow clover, much resembles the common red, but differs somewhat in habit, and the bright red flowers are larger and form a less compact head. Its produce is less in quantity, and not so nutritive, as that of the common red. Clover requires much attention to make it into hay. Its stalks are so succulent that the leaves, which are the best part, are apt to crumble and waste away before the hay is well dried. It has, therefore, been recommended to cart it to the mow or the stack before the stalks are dry, and either to put it up with alternate layers of hay and straw, or to salt it at the rate of from half a bushel to a whole bushel per ton. Green clover is good for swine.

CLOVIS, King of the Franks, born 465, succeeded his father Childeric in the year 481, as chief of the warlike tribe of Salian Franks, who inhabited Northern Gaul to the neighbourhood of the Somme and the Ardennes. This tribe at a former period had made incursions into the neighbouring territories, but were driven back into their forests and morasses. Clovis therefore united with Ragnacaire, king of Cambray, and declared war upon Syagrius (son of Aegidius or Gilon), the Roman governor at Soissons. The Romans were entirely routed near Soissons, in 486. Syagrius fled to Toulouse, to the court of Alaric, king of the Goths, whose cowardly councillors delivered him up to Clovis, by whom he was put to death. Soissons now became the capital of the new kingdom of the Salian Franks. In order to obtain assistance in withstanding the powerful Visigoths in Gaul, Clovis married Clotilda, niece of Gundebald, king of Burgundy. This princess, who had been educated in the Christian faith, was desirous that her husband also should embrace it. Her efforts were fruitless, till on an occasion when he was hard pressed in a battle against the Alemanni, which took place at Tolbiac (supposed to be the modern Zülpich) in 496, Clovis called on the God of Clotilda and the Christians. Victory declared in his favour, and the part of the territory of the Alemanni lying on the Upper Rhine submitted to the King of the Franks. The victor's conversion was now an easy matter for the eloquent St. Remigius, bishop of Rheims. Clovis was solemnly baptized at Rheims, December 25, 496, with several thousand Franks, men and women. St. Remigius at the same time anointed him. The cities of Armorica (Bretagne) then submitted to his sceptre in 497. There now remained in Gaul only two independent powers besides the Franks, viz. the Burgundians and Visigoths. The former had two kings, Godegisilus and Gundebald. Clovis made an attack upon the latter, whose territories extended from the Vosges to the Alps and the sea-coast of Marseilles. Gundebald, deserted by the faithless Godegisilus, was routed near Dijon, compelled to surrender Lyons and Vienne to the victorious Clovis, and to flee to Avignon, where he concluded a peace, in which he restored his kingdom to Gundebald, on condition that the latter should pay him tribute. Clovis returned home loaded with spoils. Gundebald afterwards violated the treaty; but Clovis, fearing the Visigoths, entered into a new alliance with him. Hostilities soon broke out between Alaric, king of the Visigoths, and Clovis. In the battle fought at Vouglé, near Poitiers, the latter gained a complete victory, slaying his enemy with his own hand. After this victory Clovis received the honour of the consulship from the Emperor Anastasius. The King of the Franks, having his head adorned with a diadem, appeared in the Church of St. Martin of Tours, clad in the tunic and purple robe, and was saluted by the people as consul and Augustus. It now became his object to rid himself by all means of all the other Frankish rulers, in order that he might leave the whole territory of the Franks to his children; and in this purpose he succeeded by treachery and cruelty. Cararic, king of the Morini; Sigebert and Cloderic, kings of the Ripuarian Franks; Ragnacaire, king of Cambray; and Rignomer, king of Mans, were successively the victims of his ambition. He died at Paris, Nov. 27, 511, in the thirtieth year of his reign. In the last year of his reign Clovis had called a council at Orleans, from which are dated the peculiar privileges claimed by the kings of France in opposition to the pope.

CLOWN, a rôle peculiar to the English stage, but bearing some resemblance to the *gracioso* of the Spaniards, and the *Hanswurst* of the Germans. The origin of the word is uncertain, some deriving it from the Latin *colonus* in the sense of a peasant farmer, and others connecting it with certain Scandinavian and other Teutonic words. On the old English stage the clown was the privileged laughter-provoker, who, without taking any part in the dramatic development of the piece represented, carried on his improvised jokes and tricks with the actors, often indeed addressing himself directly to the audience instead of confining himself to what was going on on the stage. In Shakspeare, on the contrary, a distinct part was assigned to the clown, who no longer appears as an extempore jester, although the part he plays is to a certain extent in keeping with his traditional functions. At a later period the clown was altogether banished from tragedy, and allowed to appear only in the after-piece, performing grotesque dances, singing comic songs, &c. He is now confined to the pantomime and the circus, in the former of which he plays a part allied to that of the French *Pierrot*. One of the most celebrated of modern clowns is Joe Grimaldi, who was long the chief ornament of the pantomimes given at Covent Garden.

CLOYNE, a town in Ireland, 16 miles E. by S. of Cork. It has an ancient cathedral, near which is a round tower; a Roman Catholic chapel; a free school, founded by Bishop Crow in 1726; besides National schools. From 1638 to 1833 it was the see of a bishop belonging to the Established Church of Ireland, but in the latter year it was united with Cork and Ross. From 1734 to 1753 George Berkeley, the philosopher, was bishop of Cloyne. Pop. (1891), 1126.

CLUB, the name of a peculiarly English institution, which can scarcely be said to have been introduced into any other country except America, in its original form, although the word has been adopted in various languages. It is not easy to determine at what time clubs originated in London, but it appears certain that they existed alongside of the coffee-houses in the seventeenth and eighteenth centuries. At that time, however, their character was very different from what it is now. The coffee-houses of those days were the nearest representatives of the modern clubs, while the clubs were commonly nothing but a kind of restaurants or taverns where people resorted to take their meals. There was one feature, however, which was peculiar to clubs from the first, and distinguished them from coffee-houses, namely, that while anybody was free to enter a coffee-house, it was absolutely necessary that a person should have been formally received as a member of a club, according to its regulations, before he was at liberty to enter it. Among the earliest of the London clubs was the Kit-cat Club, formed in the reign of Queen Anne. Among its forty members, who used to meet at a pastry-cook's shop in order to do justice to certain mutton pies for which he was famous, were six dukes, among them the Duke of Marlborough; five earls; many of the most distinguished leaders of the Whig party, such as Sunderland, Halifax, Sir Robert Walpole, and others; and several of the leading authors of the day, among them, Vanbrugh, Congreve, Addison, and Steele. Another club formed about the same time was the Beefsteak Club. Originally these two clubs had no pronounced political views, but in the end they began to occupy themselves with politics, the Kit-cat Club being Whig, and the Beefsteak Club Tory. There have been several Beefsteak Clubs since. During the last century it was common to give eccentric names to clubs, and the conditions of being admitted to membership in any one of these clubs were as a rule equally remarkable. Among these may be mentioned the Surly Club; the Split-farthing Club; the Ugly Club (of which Wilkes was elected president for life, and Mirabeau was an honorary member); the Unfortunate Club; the Lying Club, the members of which were not permitted to utter a single truth during their sittings, unless they had been expressly authorized to do so by the president, &c. &c. Perhaps the most celebrated club of last century was that which was first called The Club *par excellence*, but which was afterwards known as the Literary Club. It was founded in 1764, and numbered among its members Dr. Johnson, who was for a long time its president, Sir Joshua Reynolds, Edmund Burke, Oliver Goldsmith, Edward Gibbon, and others. In 1864 the hundredth anniversary of its foundation was celebrated. The most important London political clubs of the present day are the Carlton Club and the Reform Club. The former is the principal club belonging to the Conservative party in the kingdom, and the building in which its members meet, which is the most splendid building of the kind in the kingdom, may be regarded as the head-quarters of the Conservative party. This club was founded in 1832, and the number of its members is 1600. The Reform Club, the building belonging to which stands next to that of the Carlton Club, was long the great club of the Liberal party, founded in 1837, members 1400. Among the other important London clubs are the National Liberal (7000 members), Constitutional (6550), United Service, Athenæum, Army and Navy, Travellers', &c. &c. Similar clubs exist also in all the chief towns, and are also numerous in the United States and the British colonies.

The English clubs have been imitated in different countries in Europe, but not with great success. In France, where they were introduced at an early period, they soon became associations purely political in their nature, and had no uniform and regular form, as they were only tolerated during revolutionary epochs. The Club des Jacobins, the Club des Feuillants, the Club des Cordeliers, and the Club de Montrouge, were the most famous clubs of the time of the first French revolution. None of the French clubs, or as they were afterwards called, constitutional circles (*cercles constitutionnels*), survived the *coup d'état* of the 18th Brumaire (9th Nov. 1799), by which Napoleon overthrew the Directory. Two clubs were formed during the revolution of 1830, but they were both dissolved by the law relating to associations. On the occasion of the revolution of Feb. 1848, also, hosts of clubs started into existence, the most celebrated of which was the Central Republican Society (*Société centrale républicaine*), but their duration was short, for the constituent assembly in the following year ordered them all to be closed. About the same periods as in France political clubs were introduced into Italy, Germany, and Spain, especially during the time of the first French revolution and that of 1848. In Germany, however, they were put down by a law of the empire in 1793, and in 1832 a federal decree was issued prohibiting all kinds of political societies and assemblies. In 1848 the number of clubs formed in Italy, and particularly in Germany, was very great, but their collapse was as sudden as their rise.

CLUB-HAULING, a method of tacking a ship by letting go the lee-anchor as soon as the wind is out of the sails, her head being thus brought to the wind, and then cutting the cable and trimming the sails as soon as she pays off. Club-hauling is only resorted to in perilous situations, and when it is expected that the ship would otherwise miss stays.

CLUE, of a sail (in French, *point*), is the lower corner; and hence *clue-garnets* (*cargues-point*, Fr.) are a sort of tackles fastened to the clues of the mainsail and foresail, to truss them up to the yard, which is usually termed *clueing-up* the sails. *Clue-lines* are used for the same purpose as clue-garnets, only that the latter are confined to the courses, whilst the clue-lines are common to all the square-sails.

CLUNY, a town of France, in Saône-et-Loire, lying between two mountains on the Grône; 11 miles N.W. Macon, 21 miles S. Chalons-sur-Saône; pop. 3200. Here was a Benedictine abbey, founded by William, duke of Aquitaine, at one time the most celebrated in France. Its funds were vast, and its edifices had the appearance of a well-built city. There were 600 religious houses under its direction. Only a small portion of it now remains, it having been all but utterly destroyed in 1789. The church is one of the largest in France. The town contains three parishes.

CLUVER, or CLUVERIUS, PHILIP, a celebrated German geographer and antiquarian, born at Danzig in 1580. He applied himself first to the study of law, but afterwards, against the will of his father, almost exclusively to history and geography. Being on that account left without support by his father, he was compelled to enter the service of the Austrian army, but at the end of two years he returned to his favourite pursuits. He now travelled through England, Scotland, France, Germany, and Italy, and then settled in Leyden, where he gave himself up entirely to literary labours till his death in 1623. His first geographical work, Germania Antiqua, was first published in 1616 at Leyden. Two carefully prepared antiquarian works, one upon Sicily, Sardinia, and Corsica, the other upon Italy, followed. His most important work was not published till after his death. It is entitled Introductio in universam Geographiam tam Veterem quam Novam, and is the first successful attempt at a systematic treatment of geography in the whole extent of its historical and political relations. The first edition appeared at Leyden in 1629, but it has been frequently republished. The most complete edition is that of Bruzen de la Martinière (Amsterdam, 1729).

CLWYD, a river, Wales, county Denbigh, rising on the N.E. of the Bronbanog, and entering Abergele Bay, after a course chiefly N.W. of about 30 miles, during which it is joined by several small tributaries. It is navigable at high water for vessels of 80 tons burden to the town of Rhuddlan, 2 miles from its embouchure.

CLYDE (mentioned by Tacitus and Ptolemy under the name of *Clota*), a large and beautiful river in Scotland, which rises amid the mountains and wastes that separate Lanarkshire from the counties of Peebles and Dumfries, passes by Lanark, Hamilton, Glasgow, Renfrew, Dumbarton, Greenock, &c., and forms finally an extensive estuary or firth before it enters the Irish Sea, at the southern extremity of the island of Bute. From its source to Bute its length is about 100 miles, though in a direct line the distance is much shorter. Its principal tributaries are the Douglas Water, the Mouse, the Nethan, the Avon, the Calder, the North Calder, the Kelvin, the White and Black Cart, and the Leven. Near Lanark it has three celebrated falls—the uppermost, Bonniton Linn, a cascade of about 30 feet; the next, Cora Linn, where the water takes three distinct leaps, each about as high as Bonniton; and the lowest, Stonebyres, which, like Cora, has three distinct falls, measuring altogether about 80 feet. Stonebyres Falls are 2 miles below Lanark; the others are situated about the same distance above that town. The Clyde becomes navigable at Glasgow, and is the most valuable river in Scotland for commerce. See GLASGOW.

CLYDE, LORD, better known, perhaps, under the name of Sir Colin Campbell, was born in Glasgow, October 20, 1792, where his father, John M'Liver, a native of Mull, worked as a cabinet-maker. His mother's maiden name was Campbell, and she was the daughter of a small proprietor in Islay. By the assistance of his mother's relations he was educated at the High School of Glasgow, and afterwards at the Military Academy, Gosport. In 1808 he received an ensign's commission in the 9th Regiment of foot, having previously changed his name to Campbell at the suggestion of his maternal uncle, an officer in the army. He was immediately sent off to Spain, where he served under Sir John Moore. At his death he returned to England, and forthwith joined the unfortunate Walcheren expedition in 1809. The same year he returned to Spain, and was present at most of the great battles that were fought during the Peninsular war. At the siege of San Sebastian, and at the passage of the Bidassoa, he was severely wounded. In the American war of 1814–15 he served in the 60th Rifles with the rank of brevet-captain. Some years later he was sent to the West Indies, and assisted in crushing a negro insurrection in Demerara. At this time (1823) he had the rank of brigade-major. In 1842 he was sent out to China in command of the 98th Regiment, and with the rank of lieutenant-colonel, to which he had been raised in 1832. The Chinese war finished, he again found himself in active service on the outbreak of the Sikh war in 1848. In this harassing war his services were of great importance. At the battle of Chillianwallah he was wounded after skilfully manœuvring his regiment, and at the battle of Gujerat he so distinguished himself as to receive the thanks of Parliament and the title of K.C.B. During 1851 and 1852, while commander-in-chief in the Peshawur district, he carried on ceaseless operations against the restless hill-tribes, and with uniform success. In 1854 he obtained the rank of major-general, with the command of the Highland Brigade, serving in the Crimean war under Lord Raglan as commander-in-chief. His first exploit in this war was at the battle of the Alma, when at the head of his Highlanders he stormed the heights and drove back the Russians, who were pressing hard on General Brown. His services at the battle of Balaklava—and, in short, throughout the war—were so conspicuous that at its close in 1856 he was loaded with honours, and no name in the British army stood higher than that of Sir Colin Campbell. Scarcely had the Crimean war ended when the Indian mutiny broke out. In this crisis all eyes were naturally turned on Sir Colin, and his appointment to the chief command in India was received with universal satisfaction. The day after his appointment he left London for India, and landed at Calcutta on the 29th of August 1857. Having relieved Havelock and Outram, who were hard pressed at Lucknow, and having defeated the rebels in several engagements, he proceeded to invest that place, which had become the head-quarters of the rebellion. Lucknow was taken by storm in March, 1858, and before the end of the year the rebellion was entirely crushed. Sir Colin received the thanks of both houses of Parliament, was created a peer with the title of Baron Clyde, and had an income of £2000 a year allotted him. In 1861 he was nominated a Knight of the Star of India, and in 1862 raised to the rank of field-marshal. He died August 14, 1863, and was buried in Westminster Abbey.

CLYDEBANK, a police burgh and town of Scotland, in Dumbartonshire, on the north or right bank of the Clyde, about 6 miles west by north of Glasgow. It is of modern origin, its chief industry being ship-building. Pop. in 1901, 18,654.

CLYSTERS, the name given to medicaments introduced into the lower bowel, usually for the purpose of expelling its contents. When used in ordinary cases of constipation a syringe of a peculiar construction, capable of injecting water in a lukewarm state, and either pure or mixed with soap, is often employed with immediate effect; but all kinds of clysters require to be used with moderation, as they have a tendency to impair the energy of the alimentary canal.

CLYTEMNESTRA, daughter of King Tyndareus and Leda, and half-sister of Helen. She bore her husband Agamemnon two daughters, Iphigenia and Electra, and one son, Orestes. During the absence of Agamemnon in the war against Troy she bestowed her favours on Ægisthus, and, in connection with him, murdered Agamemnon on his return from Troy, and, together with her paramour, governed Mycenæ for seven years. Orestes killed them both. See Agamemnon and Orestes.

CNIDUS, or Gnidus, a town in Caria, a province of Asia Minor, and a favourite resort of Aphroditē (Venus), who was hence surnamed the *Gnidian Goddess*. She had there three temples. In the first, probably erected by the Lacedæmonian Dorians, she was worshipped as *Doritis*. The second was consecrated to her under the name of *Aphroditē Acræa*. The third, called the Temple of the *Gnidian Aphroditē*, and by the inhabitants the Temple of *Aphroditē Euplœa*, contained Praxiteles' marble statue of the goddess, one of the master-pieces of art. This was afterwards removed to Constantinople, where it perished in a conflagration in 1461.

COACH, a general name for all kinds of covered carriages intended for the conveyance of passengers, although in Great Britain at least the word is not usually applied to the carriages used on railways. It cannot be determined at what time covered carriages first came to be used, but they were in use among the Romans. The earliest carriages appear to have been all open, if we may judge from the figures of Assyrian and Babylonian chariots found on the monuments discovered amidst the ruins of Nineveh and Babylon. At Rome the matrons used to be conveyed on festal occasions in covered carriages called *carpenta*, which was a high distinction, since during the republican period the use of carriages in the city was entirely prohibited. At a later period covered carriages richly ornamented were used by the Romans on occasions of state and ceremony. After the fall of the Roman Empire they went out of use again, and during the feudal ages the custom was to ride on horseback, the use of carriages being considered effeminate. Although mention is made of them again before the end of the thirteenth century, they do not appear to have become common until about two centuries later, when, however, they are regarded exclusively as vehicles for women and invalids. But a little later they seem to have been looked upon as appendages of sovereignty, and the German princes vied with one another in the splendour of their equipages, while their use was prohibited to the nobility and their vassals. In England a kind of carriage called a *whirlicote* was in use in the reign of Richard II.; but coaches, properly so called, are stated by Stow to have been introduced in 1564 by a Dutchman, who became coachman to Queen Elizabeth. 'After a while,' Stow adds, 'divers great ladies, with as great jealousie of the queene's displeasure, made them coaches, and rid in them up and downe the countrie, to the great admiration of all the beholders; but then by little and little they grew usual among the nobilitie, and others of sort, and within twentie years became a great trade of coach making.' They were, however, for a long period confined to the aristocracy and the wealthy classes. Sometimes six or even eight horses were harnessed to the coach, partly no doubt for the sake of display, but chiefly, we may presume, because the wretched state of the roads required that number. At first coach-wheels were very low, which circumstance also contributed to prevent the attainment of any considerable speed, and to make it necessary to use several horses to draw them; and no one seems to have pointed out the advantages of large wheels until, in 1771, a Mr. Moore attracted for a short time a good deal of attention by pointing out the fact that it was much easier to draw a coach or cart with large wheels than with small ones, and by actually constructing a coach 'very large and roomy,' which was 'drawn by one horse, and carried six persons and the driver, with amazing ease, from Cheapside to the top of Highgate Hill,' coming back 'at the rate of ten miles an hour, passing coaches-and-four, and all other carriages it came near on the road.' A contemporary account states that this coach had two large wheels, 9½ feet in diameter.

Hackney-coaches were first used in London in 1625. They were then only twenty in number, and were kept at the hotels, where they had to be applied for when wanted. In 1635 an attempt was made to restrain their use by a proclamation of Charles I.; but this being found unsuccessful, their number was limited, and a commission was given to the master of the horse to grant licences for their use. In this year only fifty were licensed. In 1634 one Captain Baily, who had formerly been a sea-captain, hit upon the plan of keeping a number of hackney-coaches, with drivers in livery, standing at a particular place (the Maypole in the Strand), where they might be had whenever they were wanted. Hackney-coaches now rapidly became more general. The four started by Captain Baily in 1634 had increased to 200 in 1652, to 800 in 1710, and to 1000 in 1771.

The following facts relating to the history of stage-coaches are taken from Chambers' Book of Days:—Stage-coaches were introduced into England about the same time as hackney-coaches. The first stage-coach in London appears to have run early in the seventeenth, and about the middle of the same century they appear to have become general both in London itself and in the better highways in the neighbourhood. Before the end of the century they were started on three of the principal roads in England. Their speed was at first very moderate, about 3 or 4 miles an hour. They could only run in the summer, and even then their progress was often greatly hindered by floods and by the wretched state of the roads generally. In 1700 a week was considered a marvellously short space of time to take to travel from York to London; and even sixty years later a fortnight was spent in going between Edinburgh and London. The first stage-coach that travelled between Glasgow and Edinburgh, which was set on foot in 1749, occupied two days in the journey. The first efforts to accelerate the speed of travelling was made by a body of Manchester merchants in 1754, who started a conveyance to which they gave the name of the 'Flying Coach,' and which was intended to overtake the distance between Manchester and London in the unusually short period of four days and a half. In their prospectus the proprietors of the new vehicle made the following announcement:—'However incredible it may appear, this coach will actually (barring accidents) arrive in London in four days and a half after leaving Manchester.' Thirty years later a Mr. Palmer of Bath, after a considerable amount of opposition, succeeded in inducing the government to put in practice certain suggestions which he made, by which he showed that great saving both of time and money in the conveyance of passengers and letters would be effected. The result was the establishment of the system of mail-coaches, which continued to be the means of travelling in England until their place was taken by the railways. The first mail-coach started between London and Bristol on the 8th of August, 1784.

The manufacture of elegant coaches is a proof of much wealth and mechanical skill in a place, many different artists being employed in their construction, who become skilful only when the demand for their work is considerable. Brussels was once famous for the manufacture of carriages, and many are built there still. Vienna-made coaches, &c., are also in good repute. But British-built carriages, especially those made in London, surpass all others for durability; and they are made at a much lower price than formerly, which has had the effect of recalling orders from rivals abroad.

COADJUTOR, a Latin term, nearly synonymous in its original meaning with *assistant*, and applied by the Romans to a kind of deputies or lieutenants given to magistrates to assist them in a press of business, or supply their place in absence. The term was afterwards introduced into the Church of Rome, and given to persons who were associated with prelates, archbishops, or bishops, to assist them or act as substitutes for them in the discharge of their functions. The appointment usually made the coadjutor the successor of his principal, and in this way great abuses arose. At first the coadjutor was nominated by the king on the presentation of the archbishop or bishop with whom he was to be associated, and who generally took care to present some nephew or cousin, and thus the highest ecclesiastical dignities became in a manner hereditary in a certain number of families, contrary to the ecclesiastical maxim which declared them to be purely elective. The abuse once commenced made rapid strides, and the coadjutorship was often given to mere children, to persons not in orders, and to non-residents. The Council of Trent introduced several reforms, by providing that the nomination of a coadjutor should not take effect except in cases of necessity or manifest utility, the pope being made sole judge of these cases. The use of the term is not confined to the Roman Church, coadjutor bishops being also known in the Anglican churches. A coadjutor is different from a *suffragan* inasmuch as the latter has a distinct portion of a large diocese assigned him under the bishop who is over the whole.

COAGULATION is the term applied to the separation of a substance from a solution, in consequence of some change in the substance itself. Thus albumen of egg can be dissolved in cold water, but if the solution be warmed, the albumen undergoes a change, separates out in white flocky masses, and cannot again be redissolved in the water. Blood drawn from an animal speedily coagulates, and a solution of silicic acid when sufficiently concentrated gelatinizes, and the silicic acid is then insoluble in water. The cause of spontaneous coagulation is not understood, and even when the effect is produced by a chemical reagent, the fact only can be stated.

COAHUILA DE ZARAGOZA, a state of Mexico, bounded N. by the United States, N.E. by the Rio Grande del Norte, which separates it from Texas, E. by Tamaulipas and Nuevo Leon, S. by Zacatecas, W. by Durango and Chihuahua. Its principal rivers are the Escondidos, Salado, Sabinas, Teya, and Meteros, all flowing into the Rio del Norte or its tributaries. The southern part of the state is mountainous, the northern part undulating or flat. The state is rich in woods and pastures, and it has several silver-mines. The principal towns are Saltillo, the capital, Coahuila or Montelovez, Santa Rosa, and Parras; area, 50,890 square miles; pop. (1893), 177,793.

COAL. The inestimable value to a nation of the mineral fuel treasured up in the coal-measures is illustrated in glancing over a geological map of Great Britain, in which the blackened portions point out the deposits of coal and the populous centres of mechanical and manufacturing industry. Coal is the primary source of our commerce and manufactures, by enabling steam-power and machinery to be produced at the most economical rate. The economical importance of the coal deposits in England and Scotland is much enhanced by the rich beds of iron ore found in their associated shales, as well as in the contiguity of the carboniferous limestone which is required as a flux in reducing the ore to a metallic state, not to speak of the lesser advantage of the proximity of the fire-clay, which furnishes the only material for building blast-furnaces capable of resisting the heat of the smelting process. The varieties of coal usually met with are anthracite, caking-coal, cherry-coal, splint-coal, and cannel-coal.

The vegetable origin of coal is now universally recognized. According to the analysis of Richardson and Regnault, quoted as of authority by the late Baron Liebig, the combustible materials in splint-coal from Newcastle and cannel-coal from Lancashire is expressed by the formula $C_{24}H_{13}O$. Comparing this with the composition of woody fibre, it appears that these coals are formed from its elements by the removal of a certain quantity of carburetted hydrogen and carbonic acid in the form of combustible oils. The composition of both of these coals is obtained by the subtraction of three atoms of carburetted hydrogen, three atoms of water, and nine atoms of carbonic acid from the formula of wood. Carburetted hydrogen generally accompanies all mineral coal; other varieties of coal contain volatile oils, which may be separated by distillation with water. The origin of naphtha is owing to a similar process of decomposition. The inflammable gases which stream out of crevices in the beds of mineral coal always contain carbonic acid, together with carburetted hydrogen and olefiant gas. In 100 volumes of fire-damp there were found on analysis 91·36 vols. light carburetted hydrogen, 6·3 olefiant gas, and 2·32 nitrogen gas. The evolution of these gases shows that a chemical change is constantly in progress in the coal. The action which takes place during the combustion of coal, and which may be observed in an ordinary fire, seems to consist in the separation of the hydrogen in combination with part of the carbon, in the form of hydrocarbons of various degrees of volatility. Thus, some are gaseous, and burn with flame; others are fluid, and form the black bituminous matter which swells up and appears to boil. Then when all the volatile matter has been expelled, the red glowing mass of coke which remains consists of the carbon which has been in excess of the hydrogen in the coal.

In the crystalline coal in common use the combined effects of pressure, heat, and chemical action upon the substance have left few traces of its vegetable origin; but in the sandstones, clays, and shales accompanying the coal, the plants to which it principally owes its origin are presented in a fossil state in great profusion, and frequently with their structure so distinctly retained, although replaced by mineral substances, as to enable the microscopist to determine their botanical affinities with existing species. The sigillaria and stigmaria, the lepidodendron, the calamite, and tree-ferns are amongst the commoner forms of vegetable life in the rocks of the coal formation. Trees of considerable magnitude have also been brought to light, having a recognizable relation to the modern araucaria. The animal remains found in the coal-measures indicate that some of the rocks have been deposited in fresh water, probably in lakes, whilst others are obviously of estuarine origin, or have been deposited at the mouths of rivers alternately occupied by fresh and salt water.

Cannel-coal and the richer hydrocarbons are employed in the production of coal-gas. The tar, naphtha, and ammonia evolved in the process are all utilized; some of the most beautiful colours of the calico-printer, for instance, resulting from the decomposition of coal-tar. For manufacturing purposes coals are generally considered to consist of two parts—a volatile or bituminous portion, and a substance comparatively fixed, and usually known by the name of *coke*. This latter form of coal is extensively used in locomotive engines on railways, in consequence of its yielding no smoke, the volatile matter, or that which forms the smoke of coal, being removed by ignition. As the bituminous or volatile part of coal yields the gas used for lighting, it has been found that the heating power of the coal resides in the coke, and no heat is lost by first extracting the gas from coal by the usual methods of burning, or rather distilling coal. See FUEL.

Coal, as an inflammable substance, appears to have been known to the ancients, and to the Britons before the Romans visited this island, it being found so frequently in ravines and beds of rivers of a colour and texture so decidedly different from the strata which in general accompany it; but as at that period, and for centuries afterwards, the country was covered with immense forests, which supplied abundance of fuel for every purpose of life, there was no necessity for using coal as fuel. The working of coal, therefore, only became an object of attention as population and civilization advanced, when agriculture began to be studied, the woods cleared away, and the arts of civil life cultivated; accordingly we find that the working of coal in Britain, as an article of commerce, is comparatively of modern date, and appears to have commenced about the end of the twelfth century. The first charter giving liberty to the town of Newcastle-upon-Tyne to dig coal was granted by Henry III. A.D. 1239; it was then denominated *sea-coal*, on account of its being shipped for places at a distance. In the year 1281 the Newcastle coal-trade had become so extensive and important that laws were enacted for its regulation. In Scotland coals began to be wrought much about the same time; and a charter was granted in the year 1291 in favour of the abbot and convent of Dunfermline, in the county of Fife, giving the right of digging coals in the lands of Pittencrieff, adjoining the convent. Coal began to be used for iron smelting about the beginning of the seventeenth century. The working of coal gradually increased, though on a very limited scale, until the beginning of the last century, when the steam-engine was brought forward by Newcomen in the year 1705, and was applied to collieries in the vicinity of Newcastle about the year 1715. This machine produced a new era in the mining concerns of Great Britain, and, as it were in an instant, put every coal-field within the grasp of its owner. Collieries were opened in every quarter; and the coal-trade rapidly increased to an astonishing extent. This extension of the trade was greatly aided by James Watt, who so very much improved the construction and power of the steam-engine as to render it one of the most complete and most useful pieces of mechanism. To Newcomen and Watt the mining interest of Great Britain is highly indebted; to the latter the empire owes its great rise and improvement as a manufacturing country.

The collieries of Great Britain are now upon the most extensive scale, and are of the first importance to the kingdom, both as regards its political and commercial interests; so much so that it is evident that, without cheap coal, the manufactures of Great Britain could not be brought forward in competition with those of the other nations of the world where manual labour is cheap. The capital employed in the collieries, and in the shipping connected with them is immense, amounting to many millions.—The great coal-field of Britain, which is composed of numerous subordinate coal-fields, crosses the island in a diagonal direction, the south boundary line extending from near the mouth of the river Humber, upon the east coast of England, to the south part of the Bristol Channel on the west coast; and the north boundary line extending from the south side of the river Tay in Scotland, westward by the south side of the Ochil Mountains, to near Dumbarton, upon the river Clyde; within these boundary lines North and South Wales are included. This region is about 260 miles in length, and on an average about 150 miles in breadth; total area about 12,000 square miles. Coal-beds occur in other formations of later geological age. The wealden, chalk, and tertiary formations also contain seams of greater or less thickness, but none of the later deposits equal in economical importance those of the carboniferous system. In 1891 the total output of coal in Britain amounted to 185,479,126 tons; in 1899 to 220,094,781. See BRITAIN.

The coal-fields of the United States have an area of 192,000 square miles, exclusive of the vast coal region of the Rocky Mountains and the Pacific Coast, the area of which has not yet been fully ascertained. Coal is found in a large proportion of the States, although not yet raised in them all. About two-thirds of all the quantity raised belongs to the anthracite variety, which occurs chiefly in Pennsylvania. The total output of coals in the Union in 1900 was 274,847,780 tons.—The other chief coal-producing countries are Germany, which in 1899 raised 101,000,000 tons, France following with 30,000,000 tons, and Belgium with 21,000,000. Immense coal-fields are also known to exist in China, India, Japan, Australia, and the Dominion of Canada, so that the supplies of this valuable mineral appear to be practically inexhaustible.

Public attention has been directed to the possible exhaustion of the coal-fields of Great Britain within a few centuries, by the enormously increasing consumption of fuel in carrying on her industries, and by the demands made upon her for export. The inquiries of a parliamentary commission into the state and prospects of the British coal-measures, and whose report appeared in 1871, brought out the result (more or less uncertain) that there was a sufficiently large amount of workable coal to keep up the then annual output for a period of nearly 1200 years. This was so far reassuring, but since then the output has greatly increased, and is still increasing, though no one can foresee what may happen in the future. However, the British people have been put on guard against a wasteful expenditure of that portion of their mineral wealth upon which the commercial and manufacturing prosperity of the nation so largely depends. As bearing on this subject, it is an interesting fact that coal has been recently discovered at a workable depth near Dover, this being a hitherto unsuspected source of supply. For the methods of mining coal, see MINING.

COAL BRASS. This term is applied to iron pyrites, on account of its brassy appearance. Coal containing much pyrites is bad for iron smelting, and it is unpleasant for domestic use on account of the sulphurous acid which it gives off on burning. A pyritiferous coal leaves a ruddy ash, the colour being due to the oxide of iron formed. The name is also applied to a variety of ordinary carbonate of iron ore. It contains little or no pyrites, and has a black colour, and sometimes a crystalline fracture. This would seem to be an economical ore of iron, whereas the true coal brass is useless for such a purpose.

COAL-CUTTING MACHINE. Various machines have been invented for cutting out coal, the chief objects they are intended to serve being the cheapening of the work, the saving of a large quantity of coal, which in the ordinary process of holing by hand labour with the pick is broken up into slack and dust, and the removal of the danger attending upon the employment of hand labour. In the case of machines worked by compressed air there is also the advantage of better ventilation and a cooler atmosphere in the mine, owing to the discharge of the compressed air after each stroke of the tool. In some of these machines the instrument of excavation is a pick worked by a bell-crank lever, with an action like that of an ordinary pick, while others have a straight-action cutting-tool which cuts out a horizontal slot or groove in a seam of coal while the machine traverses along the working face of the coal. In the compressed-air machines the air is supplied by an air-compressing engine at the surface, the air being conveyed down the shaft and along the mine in cast-iron pipes. The machine may be worked at a distance of a mile or more from the shaft. One of these machines, invented by Messrs. Ridley & Jones, is about 3 feet long, 1½ foot wide, and 2 feet high; it has flanged wheels to run on the ordinary pit tramway, and weighs about ½ ton. Motion is given to it by a 6-inch cylinder high-pressure engine, the pick being connected with the end of the piston-rod; and by varying the mode of connecting, the blow may be given either right-handed or left-handed. There is an arrangement for regulating the depth and force of the blow similar to that used in the steam-hammer; and as the attendant has his hand constantly upon this regulator while the machine is at work, the precision obtained is fully equal to anything that could be obtained by hand labour. Indeed the collier directing the machine must use the same amount of judgment as if he were using an ordinary pick, the principal difference being that he is enabled to strike five blows with the machine for one blow with the hand.

COAL GAS. See GAS.

COALITION. In the beginning of the French revolution the French authors used this expression by way of contempt, to denote the confederation of several powers against France; the word *alliance* appearing to them perhaps too noble for the object. From that time the word has been received into diplomatic language; and the diplomatists of the continent of Europe have made this distinction between alliance and coalition, that the former is more general, the latter is directed against a particular enemy for a distinct object. (See FRANCE—History.)—The word *coalition* is also used to denote the union of several political parties. Thus we speak of the coalition of Fox and North, and of the Aberdeen coalition ministry.

COAL TAR. See TAR.

COAMINGS, of the hatches or gratings, in ships, certain raised work rather higher than the deck, about the edges of the hatch-openings of a ship, to prevent the water on deck from running down. There is a rabbet or groove in their inside upper edge to receive the hatches.

COAST-GUARD, a force formerly intended only to prevent smuggling, but now organized also for purposes of defence. Before the passing of the Coast-guard Service Act of 1856 this force belonged to the customs department, but by the act mentioned it was provided that after a given day it should be raised and governed by the admiralty. It was also enacted that the force was not to exceed 10,000, including officers; lands held for the then existing coast-guard were to be vested in the admiralty, and powers were given to the admiralty to acquire new stations for the service, no station to exceed 3 acres. According to the new system Great Britain and

Ireland are divided into eleven districts, each of which is subdivided into a number of sub-districts. The eleven districts are each under a captain in the navy, who has a guard-ship for his head-quarters. Each sub-district is in the charge of an inspecting officer subject to the superior of the district, and there are generally revenue cruisers or gunboats attached to each district. The men, who are generally old men-of-war's men of good character, have high pay, and are besides furnished with free cottages and 1*s.* 4*d.* a day for provisions. They may be required at any time to serve on board the guard-ships and cruisers belonging to the service, and in time of war they may be called on to serve anywhere. The whole force is under a controller-general, who ranks as a commodore of the first class. The total number of officers and men serving in the coast-guard on shore is at present 4200.

COASTING-TRADE, trade carried on by sea between the ports of the same country. In some countries the coasting-trade is retained as a home monopoly, and this used to be the case in the United Kingdom, but by 17 and 18 Vict. cap. v. the coasting-trade of Great Britain was thrown open to foreign vessels, subject to the same rules, dues, and regulations as British sailing ships and steamers; but power was given to the queen to impose by an order in council retaliatory prohibitions and restrictions on the ships of such countries as should impose restrictions and prohibitions on British ships. The dues and regulations to which vessels engaged in the coasting-trade are subject are different from those which relate to vessels engaged in the oversea trade, and masters are required to keep books showing that their cargoes are strictly such as are allowable by the rules of the coasting-trade.

COATBRIDGE, a municipal burgh of Scotland, in the county of Lanark, 9 miles east of Glasgow. It owes its rise to the working of the coal and ironstone of this portion of Lanarkshire, and the place has rapidly grown from a trifling village to a thriving but not very attractive town, with few buildings worthy of note. The inhabitants are chiefly engaged in the numerous iron-works in the town and neighbourhood, about half of the blast-furnaces of Scotland being situated in this locality. The chief branches of the iron trade carried on here are the manufacture of pig-iron, malleable iron, and iron tubes. There are also important engineering and other establishments, and fire-bricks, fire-clay goods, preserves and confectionery, are extensively manufactured. Pop. in 1871, 15,802; in 1881, 17,500; while in 1891 it had increased to 30,033, and in 1901 to 36,981.

COAT OF ARMS, the ensigns armorial of a person; so called because originally worn on some part of the armour. Their origin is to be referred to the age of chivalry, when they were assumed as emblematic of the adventures, love, hopes, &c., of the knight, and were useful for distinguishing individuals whom it was difficult to recognize, covered as they were from head to foot with armour. This perhaps may even have been the origin of the usage. As everything else became hereditary in Europe—estates, dignities, titles, privileges—so the favourite emblem of the knight became the adopted badge of the family, the figures or characters employed in the coat of arms began to receive names, and the language and science of heraldry came into existence. The right to bear arms thus became a distinctive mark of gentle birth. In France the feudal privileges and nobility were abolished by the revolution. Under Napoleon I. the imperial *noblesse* wore a certain number of feathers indicative of their rank: a simple chevalier one; a baron three; a duke seven. See HERALDRY.

COAT OF MAIL, a piece of armour in the form of a shirt, consisting of a close net-work of iron or steel rings, or of a strong linen or leather jacket, covered with small laminæ or plates, usually of tempered iron, overlapping each other like the scales of a fish. See ARMS AND ARMOUR.

COBALT, a metal which occurs combined with arsenic, nickel, and other metals; it also occurs as a sulphide and as a phosphate. After the ore has been calcined, oxide of cobalt remains, but impure from the presence of other metallic oxides. When this oxide has been purified and reduced to the metallic state the cobalt is obtained of a white colour inclining to gray, and, if tarnished, to red, with a moderate lustre. Its fracture is compact; it is hard, brittle, and of a specific gravity of 8·5 to 8·9. Like nickel, it is strongly magnetic. It undergoes little change in the air, but absorbs oxygen when heated in open vessels. It is attacked, though slowly, by sulphuric or hydrochloric acid, and is readily oxidized by means of nitric acid. Two basic oxides of cobalt are known, and some intermediate oxides. The protoxide is of an ash-gray colour, and is the basis of the salts of cobalt, most of which are of a pink hue. When heated to redness in an open vessel it absorbs oxygen, and is converted into a higher oxide. It may be prepared by decomposing the carbonate of cobalt by heat in a vessel from which the atmospheric air is excluded. It is easily known by its giving a blue tint to borax when melted with it. It is employed in the arts, in the form of smalt, for communicating a similar colour to glass, to earthenware, and to porcelain. *Smalt*, or powder blue, is made by melting three parts of fine white sand, or of calcined flints, with two of purified pearl-ash and one of cobalt ore previously calcined, and ladling it out of the pots into a vessel of cold water; after which the dark-blue glass, or zaffer, is ground, washed, and distributed into different shades of colours, which shades are occasioned by the different qualities of the ore, and the coarser and finer grinding of the powder. Smalt, besides being used to stain glass and pottery, is often substituted in painting for ultramarine blue, and is likewise employed to give to paper and linen a bluish tinge. The chloride of cobalt is well known as a *sympathetic ink*. When diluted with water so as to form a pale pink solution, and then employed as ink, the letters which are invisible in the cold become blue if gently heated. It is prepared by dissolving precipitated oxide of cobalt in hydrochloric acid with the aid of heat, and diluting with water. The nitrate of cobalt is readily got by dissolving cobalt or its oxide in nitric acid, and crystallizing the solution. It is a deliquescent red salt, which dissolves in water with a pink colour. The peroxide of cobalt is of a black colour, and is formed by adding a solution of bleaching-powder to a cobaltous salt, or by passing a current of chlorine gas through water holding cobaltous hydrate in suspension. It does not unite with acids; and when digested in hydrochloric acid the cobaltous chloride is generated with the disengagement of chlorine. When heated it is converted into one of the intermediate oxides.

Ores of Cobalt:—1. *White cobalt ore*, or *bright white cobalt ore*, consists of cobalt, arsenic, and sulphur. Its colour is tin-white, liable to tarnish, with little lustre. It occurs massive and crystallized, in cubes and in octohedrons. It is hard and brittle. Specific gravity about 6. Before the blow-pipe it melts, and gives an arsenical smoke and odour. It forms a metallic globule, and gives to borax a blue colour. It occurs chiefly in primitive rocks, and is frequently accompanied by bismuth. It is found most abundantly in Germany, Sweden, and Norway, and also occurs in several other European countries. 2. *Gray cobalt ore* is an alloy of cobalt with arsenic and iron, and is sometimes accompanied with small portions of nickel and bismuth. Its colour is light gray, liable to tarnish. It occurs massive or disseminated, and is never crystallized. It has been found in the United States at Chatham, Connecticut, but has not been wrought advantageously. It also occurs in Bohemia, Saxony, and France. 3. *Red cobalt ore*, or *cobalt bloom*, is a hydrated arseniate of cobalt, of a beautiful peach-blossom red colour. It occurs massive, disseminated, and in minute crystals. It accompanies other ores of cobalt.

COBAN, or Vera Paz, a city of Central America, in the state of, and 90 miles north-east of the city of Guatemala, capital of the department of Vera Paz, on the left bank, and near the source of the Dulce or Dolce. It was formerly a mission station of the Dominicans, whose memory is still held in great esteem. The Dominican monastery is now deserted. The valley is exceedingly fertile, and covered with plantations of sugar-cane, bananas, and pimento-trees, and various kinds of fruit-trees. Pop. (1893), 27,700.

COBBETT, William, a celebrated English writer and politician, was the son of a farmer and publican at Farnham in Surrey, and born there on 9th March, 1762. An interesting account of the early life of this remarkable man is given by himself in his autobiography. In 1783 he set out on the top of the coach to try his fortune in London, and arrived there with only half-a-crown in his pocket. He succeeded in obtaining a situation as copying-clerk to an attorney of Gray's Inn, where he remained for nine months—the dreariest, according to his own account, that he ever spent in his life. Determined to find some other sphere of employment he quitted London for Chatham, enlisted in the 54th Regiment, and after continuing there for a year proceeded with it to New Brunswick. During his stay at Chatham he set himself assiduously to study and the improvement of his mind. He remained four years in America, during which time his regular habits and ability and attention in the discharge of his military duties effected his promotion to the rank of sergeant-major. In 1791 he returned to England with the regiment, and shortly after arriving there obtained his discharge. After a short stay in England, and a stay of six months in France in 1792, he embarked at Havre for America. He landed at New York in October, 1792, and continued in America for eight years, where he occupied himself with literary labours, chiefly of a political kind, commencing his career by an attack on Dr. Priestley, then recently landed in America, in a pamphlet entitled Observations on the Emigration of a Martyr to the Cause of Liberty, and signed *Peter Porcupine*. Under this famous *nom-de-plume* a succession of papers appeared, all of a strongly anti-republican tendency, which were afterwards republished in England in twelve vols. Before leaving America he published a life of Thomas Paine. In June, 1800, he sailed for England, and on his arrival started the Porcupine, a daily paper, which zealously supported the measures of Pitt, but met with little success. In a subsequent paper, the Weekly Register, he was more fortunate; and by the great circulation which it enjoyed he found himself enabled to purchase the estate of Botley in Hampshire, where for several years he employed himself in agricultural and other country pursuits. The Register continued to appear regularly every week up to the period of his death. Not long after its commencement symptoms of a gradual change began to appear in Cobbett's political opinions, and from high conservative he passed over to extreme radical principles. In 1803 a prosecution for libel on the lord-lieutenant and other officers of state in Ireland was instituted against him, and resulted in his being sentenced the following year to a fine of £500; while a second action, brought almost immediately afterwards, subjected him to a second fine of the same amount. For some years after this he continued to give the government much disquiet; and in 1810, owing to some remarks of his in the Register of July 10, 1809, on the flogging of some militiamen, he was again prosecuted for libel, and sentenced to imprisonment for two years and a fine of £1000. This last was paid by a subscription among his friends. Nowise daunted, he continued his attacks on government as soon as he was liberated, and commenced his celebrated Twopenny Trash, which reached a sale of 100,000, and from its supposed influence on the working-classes brought about the passing of the noted Six Acts. Partly to escape their operation, and partly also, it is believed, on account of pecuniary embarrassments, he retreated to the United States, and remained there for two years, residing principally in Long Island. He returned to England in 1819, and settled at Barnes Elms in Surrey, his estate of Botley having previously been sold. After a few years he quitted Barnes and returned to Hampshire, where he rented the farm of Normandy, about 7 miles from Farnham. In 1820 he endeavoured, unsuccessfully, to be returned member for the city of Coventry. About the same period he commenced in the Register a series of papers entitled Rural Rides, afterwards reprinted, which present most charming pictures of English country scenery, and are among the best of his productions. In 1824–27 he published a History of the Protestant Reformation in England and Ireland, in which he vilified Queen Elizabeth and the leading reformers, but added in no way to his literary reputation. The work was eagerly adopted by the Roman Catholics, who caused translations to be made of it into various European languages. In 1831 he was again prosecuted for libel, on the ground of an article in the Register alleged to be published with the view of exciting the agricultural labourers to acts of violence. He conducted his own defence in a speech of six hours, and the jury not being able to come to a verdict the trial ended in their discharge. On the passing of the reform bill in 1832 Cobbett was returned member to Parliament for Oldham; but his success in this capacity was indifferent. Nevertheless, at the general election in December, 1834, he was again returned to Parliament for Oldham. The late hours and crowded assemblies in the House of Commons, so different from his usual habits, had, however, told unfavourably on his health. On 25th May, 1835, he took part in the debate on the motion of the Marquis of Chandos on agricultural distress. The exertion of speaking on that occasion proved too much for him, and the following morning he was conveyed to his farm of Normandy, where he expired on the 18th of June following, in his seventy-third year. In addition to the writings already referred to Cobbett is the author of an English and a French Grammar; Advice to Young Men and Women; containing many useful hints; Cottage Economy; Village Sermons; A Year's Residence in America; and other works. Cobbett wrote in a pure and vigorous English style, and his writings contain a great amount of information and sound practical advice, though disfigured by dogmatism, crotchetiness, and extravagance.

COBDEN, Richard, the great 'apostle of free trade,' born at the farm-house of Dunford, in the county of Sussex, on the 3d of June, 1804; died in London on the 2d of April, 1865. After receiving a very meagre education at the grammar-school of Midhurst, he was taken as an apprentice into a Manchester warehouse in London belonging to his uncle, and in this situation he rapidly made up for the defects of his education by his own diligence, and soon acquired a thorough acquaintance with the business to which he was apprenticed. In 1830, being left by the failure of his uncle to his own resources, he obtained some advances of money, and, along with some relatives, started a cotton manufactory in Manchester, which in a few years succeeded in producing fabrics equal in point of quality to the best manufactured in London. By several journeys that he now made to France, Belgium, Switzerland, and the United States, chiefly in the interest of the firm, he not only increased his business connections, but matured and enlarged his views. His first political writing was a pamphlet on England, Ireland, and America, which was followed by another on Russia. In both of these he gave clear utterance to the political views to which he continued through his life rigidly to adhere, rejecting the course of policy based upon the theory of the balance of power, advocating non-intervention in the disputes of other nations, and maintaining it to be the only proper object of the foreign policy of England to increase and strengthen her connections with foreign countries in the way of trade and peaceful intercourse. These views, although disregarded or considered as visionary in Parliament, were warmly received in industrial and commercial circles, and secured Cobden a considerable number of followers, especially in Manchester. To the cause of education in this city he did great service by the foundation of the Athenæum, an institution on a large scale, intended for young merchants and manufacturers (1837). After returning from extensive travels in the East and in Germany, he entered actively on a course of agitation with the view of carrying into effect his political views. It was about this time that the agitation against the corn-laws began, and soon after the Anti-Corn Law League was formed in 1838; it was joined by Cobden, who expended all his energies on behalf of the cause to support which the league had been founded; and it is chiefly the extraordinary activity and perseverance of Cobden, joined to the zeal of his supporter Bright, that England has to thank for the final victory of free-trade principles. In 1841 Cobden was returned to Parliament by Stockport, a seat for which he had been an unsuccessful candidate in 1837. In his very first speech in Parliament he took occasion to point out the unjust way in which the corn-laws operated, and, undeterred by the failure of his first attempts, he returned again and again to this subject. After five years of unwearied contest he at last succeeded in convincing Sir Robert Peel himself, at that time prime minister, of the pernicious action of the corn-laws, and in inducing him to bring in a bill for their repeal. The bill passed both houses of Parliament before the end of June 1846, and Sir Robert Peel was the first to congratulate Cobden on his victory in a speech delivered in the House of Commons. During the labours of this long struggle Cobden had been obliged to neglect his business, which before agitation commenced had been a highly prosperous one. As a compensation for the loss he had thus sustained a national subscription was made, and a sum of about £70,000 presented to him. Immediately after the passing of the Corn Law Repeal Bill Sir Robert Peel's government resigned, and his successor, Lord John Russell, offered Cobden a place in the new government. This, however, Cobden declined, in order not to sacrifice his independent position in Parliament. After again visiting several countries on the Continent, where he was generally received with enthusiasm, he returned to his parliamentary duties in 1847, having been returned without opposition as one of the members for the West Riding of Yorkshire. He now appeared chiefly as the advocate of parliamentary reform, economy and retrenchment in the management of the finances of the country, and a policy of non-intervention; in all of which he found a firm and ready ally in Bright. His advocacy of a peace policy did not in every case add to his popularity. His opposition to the policy of Lord Aberdeen in 1853, which ultimately led to the Russian war, met with no success; and although in 1857 he carried a vote of censure on Lord Palmerston's Chinese policy, his action in this case was so displeasing to the country generally, that he did not obtain a seat in the new Parliament elected after the dissolution of the former one in consequence of the vote mentioned. Two years later, however, in 1859, he was returned for Rochdale, and was again offered a place in the government as president of the Board of Trade, along with a seat in the cabinet, but these offers he again declined. In 1860 he negotiated a treaty of commerce with France, and in reward for his services on this occasion he was offered a baronetcy, a seat in the privy-council, and several other offices and dignities, all of which he persistently refused. During his latter years he lived a good deal in retirement on his estate at Dunford, but died on a visit to London. A collection of his political writings appeared in two vols. in 1867, and a collection of his speeches (Cobden's Speeches on Questions of Public Policy) in two vols. in 1870.

COBI. See Gobi.

COBIJA, or, as it is also called, Puerto La Mar, after the name of the first president of Bolivia, a seaport of Chili, in the territory of Antofagasta (formerly belonging to Bolivia), on the shore of the Pacific. It stands in a desert region, and is entirely dependent on the mines in the neighbourhood. The roadstead is tolerably safe, but the landing-place is far from good. All the water used for drinking must be obtained by distillation, and the means of subsistence come from a considerable distance. The population is about 4000, including those who are going to and from the mines.

COBLE, or Cobble, a flat-floored boat with a square stern, furnished with a lug-sail and also propelled with oars. It has a sharp high bow, is admirably constructed for encountering a heavy swell, and is used in fishing, especially on the east coast of Britain. The rudder extends for some distance below the stern. There is also a small rowing-boat with the same name used by salmon-fishers and others.

COBLENTZ (anciently *Confluentes*, from its situation at the confluence of the Rhine and Moselle), a town of Germany, formerly the residence of the Elector of Treves, now the capital of the Prussian circle of Coblentz and of the province of the Rhine. It is situated, amid picturesque and delightful surroundings, on the tongue of land between the Rhine and Moselle, the former being crossed by a bridge of boats leading to Ehrenbreitstein, and by a railway-bridge, the latter by a stone bridge built in 1344 and another railway-bridge, both leading to the suburb of Lützel-Coblentz. It consists of an old and a new town, the former with many narrow irregular streets, the latter well laid out and with handsome streets. There are various squares or open areas; and among public monuments are the provincial memorial for the Emperor William I. and that of the Empress Augusta. Among the churches may be mentioned that of St. Castor, a Romanesque basilica with four towers, of the end of the twelfth century, the Liebfrauenkirche, with Romanesque nave and Gothic choir, and the Florinskirche (of the twelfth century). Other edifices are the royal palace, built in 1778–86 for the last Elector of Treves; the Castle of the Electors, latterly occupied as a manufactory, but now as the city savings-bank and picture gallery; the town-house; the old archive building; the gymnasium; and the industrial museum. On a height between the rivers are two forts—Fort Alexander and Fort Constantine. On the other side of the Moselle Fort Francis is situated. These works, with those of Ehrenbreitstein and others, render Coblentz one of the strongest fortresses of Germany; but since 1890 it has not been kept up as a fortress, except in so far as concerns the forts on the heights around it. The confluence of the two rivers has always given Coblentz great military importance, even from the time of the Romans, who built a strong camp here and a wooden bridge. It is a free port, and the staple emporium of the Rhine and Moselle wines intended for exportation. Millstones, manufactured from the lava of extinct volcanoes in the neighbourhood, also form an article of trade. Japanned wares, machinery, pianos, cigars, and soap, are amongst the manufactures. It is the birthplace of Prince Metternich. Pop. in 1885, including the soldiers in garrison, 31,669; in 1895, 39,633; in 1900, 45,146.

COBRA DE CAPELLO, that is, 'serpent with a hood', the Portuguese name of an East Indian serpent, the *Naja tripudians*, and of an African serpent of same genus, the *Naja haje*, or asp, both reptiles of the most venomous nature. The former inhabits India and south-eastern Asia, Java, &c. The species of the viper kind are all remarkable for the manner in which they spread out or distend the sides of the neck and head when disturbed or irritated. In the *cobra de capello* the conformation necessary to this action is found in the most perfect condition, as the animal is provided with a set of ribs or bony processes, moved by appropriate muscles on the sides of the neck, which, when expanded, give the anterior part of the body the appearance of an overhanging arch or hood, on the middle of which, posterior to the eyes, is a greenish-yellow mark, resembling the rim of a pair of spectacles. From this mark we have the name 'spectacled snake'. When disturbed by the approach of an individual, or otherwise, the cobra raises the anterior part of its body, so as to appear to stand erect, expands its hood, and is prepared to inflict a deadly wound. So exceedingly poisonous is its bite, that in numerous instances, which are well authenticated, death has followed within a few minutes; under ordinary circumstances, a few hours is the longest term that intervenes from the infliction of the bite till the death of the sufferer, where prompt measures for his relief have not been resorted to. So numerous are these snakes in some parts of India and Africa that they are frequently found in dwelling-houses, and may even take up their quarters in the beds. Death of necessity must follow under such circumstances should the animal be alarmed or irritated by any sudden motion. In case a bite is received, the first thing to be done is to make a firm and well-sustained pressure above the wound on the side nearest the heart. Experiments which have been very carefully made, prove that a sufficient degree of pressure thus kept up may prevent the poison from seriously affecting the system; and this is supported also by the good effects derived from ligatures applied by the natives of India, though such ligatures generally act but imperfectly. The effects of pressure, combined with the withdrawal of the poison, will be obtained by applying a well-exhausted cupping-glass over the wound. It is also said that volatile alkali or spirits of hartshorn repeatedly applied to the wound, and taken internally, in doses of thirty or forty drops, repeated according to circumstances, may avert the injurious consequence of the poison. Many thousands of natives are annually killed in India by cobras, and the government gives a reward for their destruction; but the people have a superstitious regard for them. To minister to the curiosity of the multitude, the jugglers of India select these venomous reptiles for their exhibitions, and, having extracted their fangs, keep them in cages or baskets to exhibit as dancing snakes. When the cage is opened, the juggler begins playing upon a pipe or other instrument; whereupon the cobra assumes the erect attitude, distends its hood, and remains balancing itself in this position until the music is suspended. It is, however, most probable that this snake, in common with lizards and other animals, is peculiarly affected by musical sounds. In Burmah a cobra entered a room while a gentleman was playing on the flute, and advanced gently towards him so long as the music continued; whenever it was suspended the animal halted, and when it was entirely stopped, it gradually withdrew. This odd circumstance induced them to spare the creature, which made its appearance on several successive days when the flute was played. With the exception of the spectacle-mark on the back of the neck and its distensible hood, the cobra is not especially distinguished as regards coloration or form. Its colour may be a dark greenish-brown, lighter towards the inferior parts, but cobras vary greatly in colour. It feeds on various small animals, reptiles, birds' eggs, frogs, &c. These snakes are good swimmers and climbers. See also ASP, and Pl. II. at REPTILES, fig. 18.

COBURG, a Saxon principality in central Germany. See SAXE-COBURG-GOTHA.

COBURG, or KOBURG, a town of Germany, capital of the duchy of Saxe-Coburg-Gotha, finely situated on the left bank of the Itz, 106 miles E. by N. Frankfort-on-the-Main. Among the principal buildings is the Ehrenburg Palace, one of the town residences of the Duke of Saxe-Coburg-Gotha, formerly a monastery of the Recollets, but converted into a ducal residence in 1549. It contains some interesting pictures, tapestry, &c. Some of the old doors exhibit beautiful specimens of marqueterie or inlaid work. There are one or two other palaces, and various monuments, including a statue of Prince Albert, consort of Queen Victoria. The chief church is the Moritzkirche, a spacious building in the late Gothic style, with a tower 334 feet high. The government-house is a handsome structure in the Italian style; and there are a town-hall, arsenal, containing a public library, theatre, &c. The educational institutions comprise a gymnasium (founded in 1605), real school, normal school, &c. On an eminence overhanging the town is the ancient castle or fortress, from which extensive views are obtained. It is now converted into a museum, with extensive collections of various kinds, including relics and writings of Luther, who resided here for three months in 1530 and wrote some of his works. This castle was occupied by the Swedes in 1632, and was unsuccessfully besieged by Wallenstein during the Thirty Years' War. The environs comprise many picturesque and interesting localities, ducal country-seats, &c. Coburg has manufactures of porcelain and ceramic wares, carriages, furniture, &c.; it has also malt-works, breweries, &c. Pop. in 1895, 18,688.

COCA, COCAINE. See SUPPLEMENT.

COCCEIUS, HEINRICH VON, born 1644 at Bremen, studied at Leyden in 1667, and in 1670 in England, at Oxford; was in 1672 professor of law at Heidelberg, and in 1688 at Utrecht; in 1690 regular professor of laws at Frankfort-on-the-Oder; repaired to the Hague in 1702, without giving up his office, on occasion of the disputes as to the hereditary succession of the house of Orange; received for his services, in 1713, the rank of baron of the empire, and died in 1719. As a lawyer he was the oracle of many courts, and his system of German public law (Juris Publici Prudentia) was almost a universal academical text-book of this science. His works comprise Exercitationes curiosæ, and Dissert. varii Argumenti, in four vols. quarto; Consilia et Deductiones, two vols. in folio; and Grotius illustratus, three vols. in folio.—His eldest son, SAMUEL FREIHERR VON COCCEIUS, born 1679 at Heidelberg, was in 1702 professor at Frankfort-on-the-Oder, and rose through many degrees to the dignity of grand chancellor of all the Prussian dominions, and was also a distinguished jurist. He died in 1755.

COCCULUS INDICUS, the dried fruit of *Anamirta Cocculus* and other allied plants of the order Menispermaceæ. It has an intoxicating or stupefying effect, and is said to be sometimes used to adulterate beer. See PICROTOXIN.

COCCUS, in zoology, a genus of insects of the order Hemiptera, family Coccidæ. Generic character: antennæ filiform, of ten articulations in the male, nine in the female, shorter than the body; rostrum pectorale, conspicuous only in the females; males with two large incumbent wings; females apterous, subtomentose, fixed, and becoming gall-shaped or shield-shaped after impregnation. These little insects are remarkable for many peculiarities in their habits and conformation. The males are elongated in their form, have long, large wings, and are destitute of any obvious means of suction; the females, on the contrary, are of a rounded or oval form, have no wings, but possess a beak or sucker formed of the extremely modified appendages of the mouth, by which they fix themselves to the plants on which they live, and through which they draw their nourishment. At a certain period of their life the females attach themselves to the plant or tree which they inhabit, and remain thereon immovable during the rest of their existence. In this situation they are impregnated by the male; after which their body increases considerably, in many species losing its original form and assuming that of a gall (whence Réaumur's name, *Gallinsecta*, for the family), and, after depositing the eggs, drying up and forming a habitation for the young. This change of form is not, however, constant to all the species, which has given rise to a division of the genus into two sections:—those which assume a gall shape, in which the rings of the abdomen are totally obliterated, are called *kermes* by some authors; and those which retain the distinct sections of the abdomen, notwithstanding the great enlargement of the body, are called *true cocci*, or *cochineal*. They are impregnated in the spring, after having passed the winter fixed to plants, particularly in the bifurcations and under the small branches. Towards the commencement of summer they have acquired their greatest size, and resemble a little convex mass, without the least appearance of head or feet, or other organs. Many species are covered with a sort of cottony down. Each female produces thousands of eggs, which are expelled by a small aperture at the extremity of the body. As soon as they are produced they pass immediately under the parent insect, which becomes their covering and guard; by degrees her body dries up, and the two membranes flatten and form a sort of shell, under which the eggs, and subsequently the young ones, are found coccated. Soon after the death of the mother the young insects leave their hiding-place, and seek their nourishment on the leaves, the juices of which they suck through the inflected rostrum, placed beneath their breast.

But it is with a view to their importance as an article of commerce, arising from their use in the arts, that the insects of this genus are particularly interesting. When it is considered that the most brilliant dyes and the most beautiful pigments, as well as the basis of the most useful kinds of cement, are their product, it will be acknowledged that to none of the insect tribe, except, perhaps, to the bee and the gall-insect, are we more indebted than to these singular and apparently insignificant little beings. Kermes, the scarlet grain of Poland, cochineal, lac-lake, lac-dye, and all the modifications of gum-lac, are either the perfect insects dried, or the secretions which they form. The first-mentioned substance is the *Coccus ilicis*. It is found in great abundance upon a species of evergreen oak (*Quercus coccifera*), which grows in many parts of Europe, and has been the basis of a crimson dye from the earliest ages of the arts. It was known to the Phœnicians before the time of Moses; the Greeks used it under the name of *kokkos*, and the Arabians under that of *kermes*. From the Greek and Arabian terms, and from the Latin name *vermiculatum*, given to it when it was known to be the product of a worm, have been derived the Latin *coccineus*, the French *cramoisi* and *vermeil*, and the English *crimson* and *vermilion*. The early Jews, the Greeks, the Romans, and until lately, the tapestry makers of Europe, have used it as the most brilliant red dye known. The scarlet grain of Poland (*Coccus Polonicus*) is found on the roots of the *Scleranthus perennis*, which grows in large quantities in the north-east of Europe, and in some parts of England. This, as well as several other species, which afford a similar red dye, have, however, fallen into disuse since the introduction of cochineal. This valuable and most important material is nothing but the bodies of the females of the *Coccus cacti* (Linn.), a native of Mexico, which feeds on various species of cactus, particularly on one called *nopal* (*Opuntia cochinillifera*). The trees, as they may be called, which produce the cochineal are cultivated for this purpose in immense numbers; and the operation of collecting the insects, which is exceedingly tedious, is performed by the women, who brush them off with the tail of a squirrel or stag. The insects are killed by being thrown into boiling water, placed in ovens, or dried in the sun. Those which are killed by the latter method fetch a higher price, from the white powder covering the insect being still retained, and thus preventing, in a great measure, the adulteration of the article. As many as 70,000 dried insects are contained in a pound of cochineal. Cochineal was cultivated by the Mexicans previous to the conquest, but probably not to any great extent. Cortez received orders from the Spanish court to pay attention to this valuable dye; and from that time the quantity increased very rapidly. Cochineal is also raised in Peru and several other parts of Spanish America. The finest, however, continues to be prepared in Mexico and Guatimala. In the East Indies a very inferior kind has been reared, which produces a coarse scarlet dye. Hayti and Brazil have tried to encourage the propagation of this insect, and it has been introduced into Java with good prospects of success. In the Canary Islands, where it was introduced in 1827, its culture has been very successful, although at first the ignorance and laziness of the inhabitants threw a great many obstacles in the way. About one-half of the whole production of cochineal now comes from these islands, but the introduction of aniline dyes has greatly injured the cochineal industry, formerly so flourishing. The imports of cochineal into Britain may amount to £80,000 or more annually.

The natural dye which this little animal affords in such abundance is a deep crimson; and the colour called *scarlet* was not discovered until the effect produced by infusing the animal matter in a solution of tin was noticed by a German chemist in 1648; after which a manufactory of this colour was established in London.

Lac is a secretion from a species of Coccus inhabiting India, where it is found in astonishing abundance on the *Ficus religiosa*. In its native state, not yet separated from the twig on which it has been deposited, it is called *stick-lac*; when separated, powdered, and the colouring matter washed from it, it is denominated *seed-lac*; *lump-lac* when melted into cakes, and *shell-lac* when purified and formed into thin *laminæ*. *Lac-lake* is the colouring matter of stick-lac precipitated from an alkaline lixivium by means of alum.

COCHABAMBA, a department of Bolivia, surrounded by those of Chuquisaca, Potosi, La Paz, Beni, and Santa Cruz. It lies entirely in the mountainous region of Bolivia, and has every variety of climate, except that of the Yungas, or hottest region. It is very fertile, and forms one of the finest and most productive regions of Bolivia. Most of its streams belong to the rivers Beni and Mamore, and thus ultimately go to feed the Amazon. Manufacturing industries are better developed here than in most other departments; but the chief employments of the people are agriculture and cattle rearing. Trade, on account of the scarcity of roads, is not of much importance. The area is about 21,500 square miles; the pop., according to an estimate for 1893, is 360,220.——The capital of the department has the same name, and is situated in a fertile valley 18 miles long and 2 miles broad, 8435 feet above the level of the sea. The town is clean and well paved, is the seat of a bishop, and has a university, a high school, hospital, &c., and manufactures woollen and cotton goods, leather, saddlery, pottery ware, &c. It has a trade in flour, wheat, maize, and barley, as well as European manufactured goods. Fruit is largely cultivated in the neighbourhood. The aromatic bark of the *Croton eleutheria*, called cascarilla, is collected here from the neighbouring districts to be sent to the seaport Arica for export. It is inferior to that which is grown in the Yungas. Pop. 27,000.

COCHIN, a seaport of Hindustan, on the Malabar coast, Madras Presidency, built on a small island. It was once a Dutch possession, but has belonged to Great Britain since 1795. Its harbour is one of the best on this coast, but its trade has for some years been declining. Pop, 17,600.—There is also here a small native state called Cochin (area, 1361 sq. miles, pop. in 1891, 722,906), and a native town of same name; pop. 13,775.

COCHIN, Charles Nicholas, engraver, born in Paris in 1688. He practised painting till his twenty-third year, and this was of considerable advantage to him in the art of engraving, to which he afterwards devoted himself. In 1731 he became a member of the Academy of Painting, and died in 1754.—His son, of the same name, born at Paris in 1715; died there in 1790, devoted himself to etching rather than to engraving. His productions are superior to those of his father. The collection of his works contains more than 1500 pieces, among which there are 112 likenesses, in the form of medals, of the most renowned French scholars and artists of his time, who were almost all his friends. We have, besides his essays in the memoirs of the Academy, several works of his, which contain interesting observations on different subjects relating to art, for instance, on Herculaneum. His frontispieces and vignettes are remarkable for neatness and taste. His views of sixteen French seaports are of great value. His composition in general is rich, delicate, and pleasing. He was a member of the Academy, and occupied several places of importance.

COCHIN-CHINA, a country forming part of the peninsula of South-eastern Asia, and generally regarded as comprising the whole of Anam and Lower or French Cochin-China. Three of the six provinces into which the latter was divided were acquired at one period, and the remaining three at another period. A persecution of the French Roman Catholic missionaries in Anam furnished the French with an occasion of regaining a footing in the East. An expedition against Cochin-China was decided on in 1857, and Saïgon was occupied. The Austro-Italian war deferred further operations till 1861, when the conquest of Metho gave the French possession of the most fertile district of Lower Cochin-China. The war continued till June 5, 1862, when a peace was concluded at Saïgon with the King of Anam, which was ratified at Hué on the 15th of April, 1863. By this treaty the king agreed to cede to the French the three provinces of Bienhoa, Saïgon, and Metho, along with the island of Poulo Condore, to permit the Roman Catholic religion in his kingdom, to open three of the ports in Tonquin to French ships, and to pay an indemnity of 24,000,000 francs (£960,000). Although the inhabitants were found to be on the whole sufficiently tractable, yet a few revolts took place, whereupon Admiral De la Grandière, on the pretext that all these disturbances had their origin in the provinces of Lower Cochin-China which had remained to Anam, namely, Vinhlong, Chaudoc, and Hatien, took possession of these provinces, and declared them French territory, 25th June, 1867. The territory thus acquired by France in this peninsula covers 21,710 square miles, and in 1894 had a pop. of 2,226,935. It is now organized in departments, prefectures, sub-prefectures, and cantons. In 1882-83 France asserted a claim to the protection of Tonquin, and indeed, the entire Anam territory, and after some fighting this claim was conceded by the king. Tonquin was accordingly taken possession of by France in 1884, and is now under French administration, native resistance having now entirely ceased. Anam forms a protectorate. See Anam.

The northern and eastern parts of French Cochin-China are hilly, but the rest of the territory consists almost entirely of well-watered low alluvial land. The lowlands, where the waters stagnate, are covered with a rank vegetation from 3 to 10 feet high; contiguous to the flowing streams are extensive rice-grounds. Where the soil is somewhat raised above the water-level it is very fertile, and in some places ranges of low hills follow the line of the rivers. In the more elevated districts are grown tobacco, sugar-cane, maize, indigo, and betel. Among the other products are tea, gums, cocoa-nut oil, silk, spices, and various farinaceous and aromatic articles. The Anamites raise also great numbers of buffaloes, cattle, hogs, and birds; the first being employed in agriculture, and, as well as oxen, for draught purposes; but since the French conquest oxen are reserved more strictly for food. Industrial arts are as yet limited among the natives. They are skilful in all kinds of basket-work, in which they use the reeds and other similar materials which abound in the low lands; silk and cotton are also wrought. But they excel in the use of wood, of which their temples, pagodas, and tombs are built, and ornamented with elaborate carving. They live in villages—numbering nearly 1000 altogether—adjacent to the rivers, which, in the unsuitableness of the country for land traffic, form almost the only means of communication. Their houses are either tiled or thatched with straw, the roofs being supported with wooden pillars; the better class are in two sections, the inner apartments and the outer verandah, which serves for use in the daytime; they are often well furnished, and not devoid of comfort. The only roads at present existing are those connecting Saigon, the capital, with the principal towns. Telegraphic communication between many of the principal places has been already opened, and is being extended. The principal export is rice, of which there is annually exported about 7,000,000 cwts., mainly to China; cotton and silk are also exported.

COCHIN-CHINA, Upper, or Dong-trong, a narrow strip of land, consisting of four provinces, on the east coast of Anam, to which empire it belongs, extending from Tonquin on the north to Champa on the south. The most important river is that on which the chief town P'hu-thua-thien or Hué stands. In the most fruitful parts of this region aloes wood (of the *Aquilaria ovata*), corn, sugar-cane, and cinnamon flourish. From October to January the weather is often very stormy, and typhoons rage frequently. The climate is healthy and pleasant. Camphor is produced in the district in the utmost perfection.

COCHINEAL. See Coccus.

COCK (*Phasianus gallus*, L.), the well-known chieftain of the poultry-yard, and rural announcer of the passage of time; whose shrill clarion, heard in the still watches of the night, inspires the invalid with cheering hopes of the coming dawn, and informs the way-worn traveller of his approach to the habitations of his kind; the appropriate emblem of vigilance, virility, warlike daring, and gallantry: domesticated, but not subdued, he marches at the head of his train of wives and offspring, with a port of proud defiance, not less ready to punish aggression against his dependents than to assert his superiority upon the challenge of any rival. At what time this valuable species of pheasant was brought under the immediate control of man it is now impossible to determine; but, as the forests of many parts of India still abound with several varieties of the cock in the wild or natural condition, it is quite reasonable to conclude that the race was first domesticated in the eastern countries, and gradually extended thence to the rest of the world. It is stated that the cock was first introduced into Europe from Persia; and Aristophanes speaks of it as the *Persian bird*. Nevertheless, it has been so long established throughout the western regions as to render it impossible to trace its progress from its native wilds.

The cock has his head surmounted by a notched, crimson, fleshy substance called *comb:* two pendulous fleshy bodies of the same colour, termed *wattles*, hang under his throat. The hen has also a similar, but not so large nor so vividly coloured excrescence on her head. The cock is provided with a sharp horn or spur on the outside of his tarsus, with which he inflicts severe wounds; the hen, instead of a spur, has a mere knot or tubercle. There is, in both sexes, below the ear, an oblong spot, the anterior edge of which is reddish, and the remainder white. The feathers arise in pairs from each sheath, touching by their points within the skin, but diverging in their course outwards. On the neck they are long, narrow, and floating; on the rump they are of the same form, but drooping laterally over the extremity of the wings, which are quite short, and terminate at the origin of the tail, the plumes of which are vertical. In the centre of the cock's tail are two long feathers, which fall backwards in a graceful arch, and add great beauty to the whole aspect of the fowl. It is in vain to offer any description of the colour of the plumage, as it is infinitely varied, being in some breeds of the greatest richness and elegance, and in others of the simplest and plainest hue. Except in the pure white breeds, the plumage of the cock is always more splendid than that of the hen. We cannot contemplate the cock, when in good health and full plumage, without being struck with his apparent consciousness of personal beauty and courage. His movements and gestures seem all to be influenced by such feelings, and his stately march and frequent triumphant crowing express confidence in his strength and bravery. The cock is strongly attached to what may be called his harem, and one is often seen strutting at the head of ten or fifteen hens. His sexual powers are matured when he is about six months old, and his full vigour lasts for about three years, varying in earliness of maturity and duration with his size and the climate.

The hen is ready to commence laying after she has moulted or changed her plumage, and is not at the trouble of making a regular nest. A simple hole, scratched in the ground, in some retired place, serves her purpose, and she generally lays from twelve to fifteen eggs before she begins to sit upon them for the purpose of hatching. Having thus taken possession of her nest, she becomes a model of enduring patience, remaining fixed in her place until the urgency of hunger forces her to go in search of food. A short time suffices; she runs eagerly about in quest of sustenance, and soon resumes her charge. Her eggs are diligently turned and shifted from the centre to the edge of the nest, so that each may receive a due degree of genial warmth, and it is not until about twenty-one days have elapsed that the incubation is completed. The strongest of the progeny then begin to chip the shell with the bill, and are successively enabled to burst their brittle prisons. She continues upon the nest till the whole are hatched and dry, and then leads them forth in search of food. The hen, except when accompanied by a young brood, is always timid, and ready to fly from disturbance; but when she is engaged in discharging the duties of maternity her whole nature is changed. She fiercely and vigorously attacks all aggressors, watches over the safety of her young with the utmost jealousy, neglects the demands of her own appetite to divide the food she may obtain among her nurslings, and labours with untiring diligence to provide them sufficient sustenance. The limits within which we are restricted forbid the attempt to give a complete history of this valuable species, which is, in every point of view, interesting. To detail all that would be necessary to illustrate it, as an object of natural history and domestic economy—the modes of breeding, rearing, preparing for the table, &c.—would require a small volume. Fortunately, almost every one who will employ his own observation may readily arrive at such knowledge. Very full histories of the species are given by Buffon and other standard authors. Temminck has, perhaps, offered the most complete, in his Histoire des Gallinacés. See Incubation and also Fowl.

COCKADE (French *cocarde*) a plume of cock's feathers, with which the Croats in the service of the French in the seventeenth century adorned their caps. A bow of coloured ribbons was adopted for the cockade in France, which soon became a national emblem and party signal. During the French revolution the tricoloured cockade—red, white, and blue—became the national distinction. National cockades are now to be found over all Europe. In Germany cockades of black, red, and gold, after being forbidden in 1832, were again allowed in 1848, and even introduced into the army. Since 1850, however, they have again ceased to be publicly worn. In Italy the former emblem of the party of progress, the green, red, and white cockade, was recognized by the government of Piedmont in 1848, and since the formation of the Kingdom of Italy it has formed the national cockade.

COCKATOO (*Plyctolophus*), a genus of climbing birds belonging to the family of the parrots, or Psittacidæ. They have a large, hard bill, surrounded at the base with a membrane or cere, in which the nostrils are pierced. Their distinguishing characteristics are a crest formed of long and narrow feathers, arranged in two lines, capable of being raised and lowered at the will of the bird, commonly white, but sometimes yellow, red, or blue; a tail somewhat longer than that of the parrot, and equal; and, for the most part, a white plumage. In the allied genera, *Calyptorhynchus* and *Microglossus*, however, the plumage is generally dark. They are found especially in marshy districts in the Eastern Archipelago and Australia. They live on roots. These birds are easily tamed, and when domesticated become very familiar. They are fond of human society, and in a state of liberty often build their nests on the huts of the natives of the countries where they are found. One of the species most frequently brought to England is the sulphur-crested cockatoo, so called from the bright yellow colour of its crest. It is a native of different parts of Australia, and is also very abundant in Tasmania. Its beak is very powerful; it can bite bits of wood to pieces, and crack the shell of a periwinkle or whelk. Another cockatoo common enough in England is the great white cockatoo. It is as large as a common fowl, totally white, with a slight roseate tinge. A very beautiful Australian cockatoo is Leadbeater's cockatoo, called also the tricolour-crested and pink cockatoo. The general colour of this bird is white, with a pink flush; the neck, breast, flanks, and under tail-coverts are deeply stained with crimson; the crest-feathers are crimson at the base, then comes a yellow bar, then another crimson bar, and the remainder is white. The Banksian cockatoo, a native of New South Wales, belongs to the genus *Calyptorhynchus*. The general colour is a deep, rich black, with a green gloss. It feeds much on the seeds of the Banksia. (See Pl. I. at ORNITHOLOGY, fig. 3.)

COCKATRICE, a serpent anciently believed to be hatched from a cock's egg. It is another name for the basilisk. See BASILISK.

COCKBURN, HENRY DUNDAS, LORD, a distinguished judge of the Court of Session, Scotland, was the son of Archibald Cockburn, of Cockpen, one of the barons of the Court of Exchequer, and born on 26th October, 1779. He studied for the Scottish bar, and was admitted a member of the Faculty of Advocates in 1800. His family connections, including his uncle Lord Melville, belonged to the Tory school of politics, but from the first he attached himself to the Liberal party. It was chiefly in connection with political cases that he rose to eminence in his profession, one leading transaction being his gratuitous defence of several persons tried for treason in the year 1818. On the accession of Earl Grey to power he became solicitor-general for Scotland, and in 1834 was made one of the Lords of Session. Lord Cockburn's conversational powers were of the first class, and he was one of the brightest ornaments of the literary society for which Edinburgh has been so long famed. No man exemplified better or had a more thorough appreciation of genuine Scottish humour. His Memorials of his Time (published posthumously in 1856) is an invaluable record of the social history of Scotland, narrated in the raciest and most genial manner. Not less interesting is his life of his friend Lord Jeffrey, published in 1852. He died at his seat of Bonally, near Edinburgh, on 26th April, 1854.

COCKCHAFER, a species of lamellicorn coleopterous insect, belonging to the genus *Melolontha* (Fab.), remarkable for the length of its life in the worm or larva state, as well as for the injury it does to vegetation after it has attained its perfect condition. By Linnæus this species, which is also known by the trivial names of *may-bug*, *dor beetle*, &c., was placed in the genus *Scarabæus* or *beetle*, from which they differ, however, in having the body less depressed, swelling out above and below into a sort of hump. The head is engaged in the corselet, which is slightly narrowed in front, and most commonly attached to the elytra behind. The antennæ are composed of ten joints in the male, six in the female, the last of which bears a series of plates set at right angles, which the insect displays at will, sometimes to the number of seven, larger and more perfectly developed in the males than females. The bodies of Melolontha are very often velvet-like, and covered with hairs and imbricated scales, differently coloured, like the butterflies. Some species are very highly adorned in this way, and present brilliant and beautiful colours. (Pl. I. at ENTOMOLOGY, figs. 52, 53, and 54.)

The cockchafer (*Melolontha vulgaris*) is hatched from an egg which the parent deposits in a hole about 6 inches deep, which she digs for the purpose. Her eggs are oblong, of a bright yellow colour, and are placed regularly side by side, though not included in any common envelope. At the end of about three months the insects come out of the eggs as small grubs or maggots, and feed upon the roots of vegetables in the vicinity with great voracity. As they increase in size and strength they become able to make their way with ease under ground, and continue their ravages upon the roots of plants. When the worm has attained its greatest size it is 1½ inch long by more than half an inch thick, perfectly white, with a red head, having a semicircular lip, and a strong pair of jaws, with which it cuts the roots for the purpose of sucking out their fluids. It has two antennæ, but is destitute of eyes. The subterranean existence of these animals is extended to four years, and as their food is not accessible during the cold season they bury themselves sufficiently deep in the soil to be safe from the frost, and pass the winter in a state of torpidity. When the spring restores them to animation and activity they revisit the upper stratum of the ground, having at each annual awakening undergone a change of skin.

At the end of the third year they have acquired their full growth as larvæ; they then cease eating, and void the residue of their food, preparatory to the change or metamorphosis which they are about to undergo. If opened at this period their strongly muscular integument is found to be completely filled with a mass of white, oily matter resembling cream, apparently destined as a reserve for the alimentation of the insect during the period of its remaining in the form of a nymph, which is scarcely less than six months. To undergo their final change these larvæ bore into the earth to the depth of 2 feet or more, where they form a rounded cavity, the sides of which are smoothed and consolidated by the application of a fluid disgorged from their mouths. The larva being thus secured it soon begins to contract in length, swells, and bursts its skin, coming therefrom as a soft, whitish nymph, having all the members shrunk and folded, uniformly arranged in the same manner, exhibiting the rudiments of elytra, antennæ, &c. The insect then gradually acquires consistence and colour, becoming of a brownish hue. This state continues about three months, by the end of which time the insect disengages its wings, limbs, and antennæ, and assumes its rank as a perfect coleopterous insect. It is in the month of February that the larva changes to nymph. During the months of March and April it approaches the surface of the earth, and about the beginning of May escapes from its grovelling mode of life to soar through the air, disporting in sunshine and shade. From this circumstance the German trivial name of *Maikäfer*, and the English *may bug* or *beetle* have been given.

Cockchafers, in their perfect state, pass the greater part of the day in a state of slumber or quietude on the leaves of the trees which they feed on, unless disturbed by the too great heat of the sun, which arouses them to fly to the shade. At eventide the whole of this drowsy population take wing, for the sake of procuring food. Their flight is loud, humming, and generally with the wind; and so little is the insect careful of directing its course that it often strikes violently against objects in the way. This peculiarity has given origin in France to a proverbial expression, applied to a thoughtless, blundering person, who is said to be as stupid as a cockchafer, 'Etourdi comme un hanneton'. Other species of similar habits are known, among them being the *M. hippocastani* of Europe, and the *Lachnosterna quercina* of America.

COCKER, a dog of the spaniel kind, allied to the Blenheim dog, used for raising woodcocks (hence the name) and snipes from their haunts in woods and marshes.

COCKER, EDWARD, an engraver and teacher of writing and arithmetic, was born in 1631. He is said to have published twenty-three books of exercises in penmanship, one of which is preserved in the British Museum. The great work with which his name is so intimately associated that the phrase, 'according to Cocker', has become proverbial, was first published in 1678 under the title of 'Cocker's Arithmetic, being a plain and familiar method, suitable to the meanest capacity, for the full understanding of that incomparable art, as it is now taught by the ablest schoolmasters in city and country, composed by Edward Cocker, late practitioner in the arts of writing, arithmetic, and engraving'. It was a posthumous publication, Cocker having died before the year of its date, about 1675, though the exact time is unknown. The book reached a thirty-seventh edition by 1720, and upon it most of the succeeding treatises on arithmetic were based. Two other works bear Cocker's name—a treatise on Decimal Arithmetic and an English Dictionary, but it has been surmised that they are not of his authorship, but of that of his publisher, Hawkins.

COCKERMOUTH, a market town and formerly a parliamentary borough in the county of Cumberland, England. It is situated at the confluence of the Cocker with the Derwent, 24 miles S.W. of Carlisle, and 260 miles N.W. of London. The town has three fine stone bridges—two across the Cocker, and the other across the Derwent a little below where it receives the Cocker. The old castle, supposed to have been built soon after the Conquest, stands on a bold eminence. Mary Queen of Scots was imprisoned in it in 1568, and in 1648 it was dismantled by the parliamentary forces. There are two established churches and a Roman Catholic church, besides others belonging to various bodies. The principal public buildings are a large and commodious market-house, a court-house, a public hall, two large auction marts for the sale of cattle and sheep, three fine new banks, &c. The industrial establishments include a sewing-thread mill, woollen factories, tanneries, engineering shops, a brewery, a confectionery work, and agricultural machine works. A railway, made in 1847, connects the town with Workington and other ports on the Irish Sea, and another connects it with the London and North-Western main line at Penrith. The Free Libraries Act has been adopted, and a public park has been acquired by gift. Cockermouth is the birthplace of the poet Wordsworth, in memory of whom a fine stained-glass window has been inserted in the church of All Saints. Till 1867 it sent two members to the House of Commons; it then lost one, and the other it lost in 1885, being merged in the county. Pop. in 1891, 5464; in 1901, 5355.

COCK-FIGHTING, an ancient sport of unknown origin, but practised both among the Greeks and the Romans. An annual cock-fight was instituted at Athens, and Æschines reproaches Timarchus, and Plato the Athenians in general, with their fondness for the cock-pit. The breeds of Rhodes and of Tanagra in Bœotia were in great esteem in Greece. The Romans seem to have used quails and partridges also for this purpose. This barbarous and brutalizing spectacle, it is well known, was long a favourite sport with the English, although repeatedly denounced and prohibited by the laws; but it is now deservedly in disrepute. Many nice rules are given for the training and dieting of cocks, and for the choice of individual combatants. 'The best cocks,' says one of the many English writers on this subject, 'should be close hitters, deadly heelers, steady fighters, good mouthers, and come to every point.' Great difference of opinion has prevailed as to the size most proper for game-cocks. Hoyle settles it at not less than 4 lbs. 8 ozs., nor above 4 lbs. 10 ozs. The *strain* from which the cock is chosen ought to be distinguished for victory. For the combat they are armed with steel or silver spurs, or *gaffles*. The place appropriated to fighting is called the *pit*, and consists generally of a mound of earth covered with sod, and surrounded by seats in circular tiers. The battle is conducted by two *setters-to* who place the cocks beak to beak. When they are once 'pitted' (observe that this verb owes its origin to the sport of cock-fighting), neither of the setters-to can touch his cock so long as they continue to fight, unless their weapons get entangled. Cock-fighting is prohibited in Britain by 12, 13 Vict. cap. xcii., under a penalty of £5, but it is nevertheless not altogether a thing of the past. In the Philippine Islands cock-fighting is pushed almost to the verge of a craze. Nearly every village has its pit, and every peasant his cock. The peasant, too, is said to rescue his fighting-cock rather than his wife or child in the event of fire, and wherever he goes he takes it with him. The sport is there practised in a very cruel form, and many are ruined by excessive betting. Throughout all Spanish America cock-fighting is more or less in favour. It was formerly a regular sport in the public schools of Britain, and schoolmasters received dues in connection with it; but this degrading phase of school-life happily exists no longer. Cock-fighting is still prevalent in China, Persia, and Malacca.

COCKLE (*Cardium*), a genus of bivalve shellfish forming the type of the family Cardiidæ. The general characteristics are—shells nearly equilateral and equivalvular; hinge with two teeth, one on each side near the beak, and two larger remote lateral teeth, one on each side; prominent ribs running from the hinge to the edge of the valve. The animal has a powerful foot, with which it burrows in the sand. For this purpose it first distends it with water, to give firmness to it. This foot may also be used to enable the animal to move from place to place, for by first bending it and then suddenly straightening it the animal may project itself to a considerable distance. The common cockle (*Cardium edule*) is common all round the coasts of the British Islands wherever it finds suitable sand-beds to live in, and is also found in the Baltic, and elsewhere. It is much used as an article of food. A prickly species, the *Cardium aculeatum*, found on the coast of Devon, is also eaten. Among American species, which, however, are not eaten, are *C. islandicum*, found to the north of Cape Cod, and *C. pinnulatum*, found about Long Island Sound. This genus is represented by fossils from the Devonian period onwards, but it attains its maximum in recent seas.

COCKNEY, a nickname for a native of London especially for one born and bred there, the term being often used with a certain sense of disparagement, and as implying ignorance of other than city affairs, or as suggesting effeminacy. As to the origin of the word there has been much dispute, and many explanations, some of them sufficiently absurd, have been propounded. In the fourteenth and fifteenth centuries it was used to mean a petted or cockered child; and, according to the most recent etymology, its original meaning was 'cock's egg', a small or misshapen egg.

COCK OF THE ROCK (*Rupicola*), a genus of perching birds of the family Cotingidæ (chatterers), characterized by a curving bill, short, rounded wings, large, strong feet, large crest, and brilliant colouring. The chief species (*R. crocea*) is found in some of the northern countries of South America. The male has the plumage of a beautiful brilliant orange colour, while the female is of a brownish hue. Several other species also inhabit that continent. Their beautiful plumage causes many of these birds to be killed, their skins being prized as ornaments.

COCK OF THE WOODS. See CAPERCAILZIE.

COCKPIT, in a man-of-war, the place where the wounded men are dressed in battle or at other times. The midshipmen had berths in the cockpit in former times. It was situated under the lower gun-deck.

COCKROACH (genus *Blatta*, family *Blattidæ*), a genus and family of insects belonging to the Orthopterous or straight-winged order, characterized by an oval, elongated, depressed body, smooth on its superior surface; the head is inclined, short, and concealed under the corselet; the antennæ are long, bristly, formed of numerous pieces, and inserted in a groove within the eyes. The corselet is scutiform, covering the head and origin of the elytra; the abdomen is terminated by two conical appendages. The legs are beset with little spines; the feet are long and compressed; the tarsi have five joints. In the common species the male has somewhat horny front wings and membranous hind ones, whilst the female is almost wingless. These insects are among the most disagreeable of the annoyances to which the dwellings of man are subject, and, where their multiplication is permitted, the ravages they commit are extensive and vexatious. They are all nocturnal, and exceedingly agile; their flattened bodies allow them to hide with ease in every crevice, whence they sally forth in hordes during the night to devour every sort of provision which is not secured from their voracity. If to a quantity of Indian-corn meal about one-third of white or red lead is added, and the mixture is moistened with molasses, so as to make it moderately adhesive, the cockroaches will greedily devour it. The repetition of this poisoned food for a few nights is generally sufficient to reduce their numbers to a very few even in the most infested houses, and will eventually cause the destruction of the whole. They may also be poisoned with preparations of arsenic, sublimate, &c., mixed with sugar or molasses, of which they are very fond. Traps, especially designed for their capture, are sometimes made use of. A paste-board or card cover, well balanced upon two pins, and placed upon the edge of a vessel nearly filled with molasses and water, makes a very good trap. The dish should be so placed that they can readily mount upon the cover, which revolves on its axis whenever the equilibrium is disturbed, and throws the cockroaches into the fluid.

Cockroaches, like other orthopterous insects, do not undergo a complete metamorphosis: the larvæ and nymphs resemble the perfect insect, except that they have merely rudiments of wings. The females lay their eggs successively and singly. The egg-case has a very singular appearance, being large, cylindric, rounded at both ends, and having a projecting dentated line or keel throughout its length on one side. This egg is half as large as the belly of the female, and she carries it for seven or eight days attached to the posterior part of the abdomen, and finally attaches it to some solid body by means of a gummy fluid.

The species of cockroach at present determined are extremely numerous. The *Blatta* (*Periplaneta*) *orientalis*, or common kitchen cockroach, was originally brought from Asia to Europe, and thence to America. It is now thoroughly domiciliated in all parts of that country, to the great annoyance of its inhabitants. This species is fond of warmth, and makes its abode near to the kitchen fireplace, about ovens, stoves, &c. The *Blatta* (*Periplaneta*) *Americana*, or American cockroach, is the largest of the genus, and grows to be 2 or 3 inches long, including the antennæ. Throughout the southern portion of this continent, and in the West India Islands, this species is very numerous and troublesome. *Phyllodromia germanica* is a smaller imported species. Three species of *Ectobia* live in woods in Britain. (Pl. I. at ENTOMOLOGY, fig. 9.)

COCKSCOMB (*Celosia cristata*), a well-known greenhouse annual of the order Amarantaceæ. The broad flattened stem, with wavy crest, and dotted with small flowers, is not found in the wild form, but is a monstrosity, produced by the union or fasciation of the stems. *C. aurea*, with yellow flowers, is also sometimes cultivated. This name is also given to other plants, such as the *Rhinanthus crista-galli*, or yellow-rattle, *Pedicularis*, or lousewort, and *Erythrina crista-galli*, the last-named a leguminous plant, whilst the others belong to the order Scrophulariaceæ.

COCK'S-FOOT GRASS (*Dactylis*), a genus of grasses of some importance. *D. glomerata* is a common British species, of a harsh, wiry texture, found on barren, sandy places, and serving as a valuable food for sheep in early spring. It improves much in cultivation. It is a native of Siberia and North America as well as Europe. A variety, *D. g. variegata* is grown in gardens. The Tussock or Tussac Grass of the southern part of South America is *D. cæspitosa*. It has been introduced into Scotland as a food for cattle.

COCKSWAIN, the officer who manages and steers a boat, and has the command of the boat's crew. The word is similar to *boatswain*, being evidently compounded of the words *cock* and *swain*, the former having the sense of a yawl or small boat.

COCOA. See CACAO.

COCOA-NUT, or COCO-NUT, a woody fruit, of an oval shape, from 3 or 4 to 6 or 8 inches in length, covered with a fibrous husk, and lined internally with a white, firm, and fleshy kernel. The tree (*Cocos nucifera*, see plate at PALMS) which produces the cocoa-nut is a palm, from 40 to 60 feet high. The trunk is straight, naked, and marked with the scars of the fallen leaves, and is surmounted by large feather-like fronds. The nuts hang from the summit of the tree in clusters of a dozen or more together. The external rind of the nuts has a smooth surface, and is of a somewhat triangular shape. This incloses an extremely fibrous substance, of considerable thickness, which immediately surrounds the nut. The latter has a thick and hard shell, with three black scars at one end, through one of which the embryo of the future tree pushes its way. This scar may be pierced with a pin; the others are as hard as the rest of the shell. The kernel is sometimes nearly an inch in thickness, and incloses a considerable quantity of sweet and watery liquid, of a whitish colour, which has the name of *milk*. This palm is a native of Africa, the East and West Indies, and South America.

Food, clothing, and the means of shelter and pro-section are all afforded by the cocoa-nut tree. The kernels of the nuts, which somewhat resemble the filbert in taste, but are of much firmer consistence, are used as food in various modes of dressing, and sometimes are cut into pieces and dried. They yield an oil which is largely imported into this country. (See COCOA-NUT OIL.) The fluid contained in the nut is a cool and agreeable beverage. Cocoa-nut trees first produce fruit when six or seven years old, after which each tree yields from fifty to a 100 nuts annually. The fibrous coats which envelope the cocoa-nuts, after having been soaked for some time in water, become soft. They are then beaten to free them from the other substances with which they are intermixed, and which fall away like saw-dust, the stringy part only being left. This, which is called *coir* or cocoa-nut fibre, is spun into yarn, woven into sail-cloth, and twisted into cables. Coir cables are strong, light, and elastic, but they are not so common now as they were before the introduction of iron cables. In the East Indies the cordage of native craft is made chiefly of coir. Coir is also made into mats, fishing-nets, &c. The woody shells of the nut are so hard as to receive a high polish, and are formed into drinking-cups and other domestic utensils, which are sometimes expensively mounted in silver. On the summit of the cocoa-nut tree the tender fronds, at their first springing up, are folded over each other so as somewhat to resemble a cabbage. These are occasionally eaten in place of culinary greens, and are a very delicious food; but as they can only be obtained by the destruction of the tree, which dies in consequence of their being removed, they are in general considered too expensive a treat. The maturer fronds are used for the thatching of buildings, and are wrought into baskets, brooms, mats, sacks, hammocks, and many other useful articles. The trunks are made into boats; they furnish timber for the construction of houses, and when their central portion is cleared away they form gutters for the conveyance of water. If, whilst growing, the body of the tree be bored, a white and sweetish liquor exudes from the wound which is called *toddy*. This is collected in vessels of earthenware, and is a favourite beverage in many parts where the trees grow. When fresh it is very sweet; in a few hours it becomes somewhat acid, and in this state is peculiarly agreeable; but in the space of twenty-four hours it is complete vinegar. By distillation this liquor yields one of the varieties of the spirit called arack (which see). A kind of sugar called *jaggery* is also obtained from the juice by inspissation.

COCOA-NUT OIL, a solid vegetable fat, is largely imported into Britain to be used in candle-making, and in the manufacture of soaps and pomatum. This fat is expressed from the albumen of the cocoa-nut kernel, and is as white as lard, and somewhat firmer. Manilla and Ceylon send large quantities of the oil to Britain.

COCOON, the name given to the web or ball spun by caterpillars before passing into the chrysalis state. The valuable product thus obtained from the silkworm is well known.

COCYTUS (from *kōkuein*, to lament), a river of ancient Epirus which falls into the Acheron. Also, among the ancient Greeks, one of the rivers of the lower world. Pausanias advances the following conjecture respecting this river:—'At Cichyrus is Lake Acheron, with the rivers Acheron and Cocytus, whose waters are very ungrateful to the taste. Homer, I imagine, had seen these rivers, and in his bold description of hell gave to the streams in it the names of those in Thesprotia.'

COD (*Gadus*), a genus of fishes belonging to the order Jugulares (soft-finned, sub-brachial, of Cuvier), distinguished by the following characters:—A smooth, oblong or fusiform body, covered with small, soft, deciduous scales, ventrals attached beneath the throat, covered by thick skin, and drawn out to a point; head scaleless; eyes lateral; operculum not dentated; jaws and anterior part of the vomer furnished with several ranges of moderate-sized, unequal, pointed teeth, forming a card or rasp-like surface; the gills are large, seven-rayed, and opening laterally; a small beard at the tip of the lower jaw; almost all the species have two or three dorsal fins, one or two anal, and one distinct caudal fin; the stomach is sacciform and powerful, the cœca very numerous, and the intestines of considerable length; they have a large, strong swimming-bladder, frequently dentated or lobed at its borders. (Pl. III. at ICHTHYOLOGY, fig. 6.)

The most interesting of all the species is the *common* or *Bank cod* (*Gadus morrhua*, Linn.). Regarded as a supply of food, or as a wonder of nature in its continuance and multiplication, this fish may justly challenge the admiration of every intelligent observer. Though plentiful in the seas washing the coasts of the United Kingdom, Scandinavia, Iceland, and other northern regions, an extent of about 450 miles of ocean, laving the chill and rugged shores of Newfoundland, is the favourite annual resort of countless multitudes of cod, which visit the submarine mountains known as the *Grand Banks* to feed upon the crustaceous and molluscous animals abundant in such situations. Hither also fleets of fishermen regularly adventure, sure of winning a rich freight in return for their toils and exposure, and of conveying plenty and profit to their homes and employers. Myriads of cod are thus yearly destroyed by human diligence; myriads of millions, in the egg state, are prevented from coming into existence not only by the fishermen, who take the parents before they have spawned, but by hosts of ravenous fishes and an immense concourse of other animals, which attend upon their migrations to feed upon their spawn; yet in despite of the unceasing activity of all these destructive causes, year after year finds the abundance still undiminished, inexhaustible by human skill and avidity, irrepressible by the combined voracity of all the tribes of ocean. This, however, is by no means the sum of destruction to which the species is liable. After the spawn is hatched, while the fry are too young and feeble to save themselves by flight or resistance, they are pursued and devoured in shoals by numerous greedy tyrants of the deep, and still worse, by their own gluttonous progenitors, clearly showing that without some extraordinary exertion of creative energy the existence of the species could not have been protracted beyond a few years. Such, however, is the fecundity with which the All-wise has endowed this race, that if but one female annually escaped, and her eggs were safely hatched, the species would be effectually preserved. This is not so surprising when we recollect that the ovaries of each female contain not fewer than 9,344,000 eggs, as has been ascertained by careful and repeated observation.

Few members of the animal creation contribute a greater mass of subsistence to the human race; still fewer are more universally serviceable than the codfish, of which every part is applied to some useful purpose. When fresh its beautifully white, firm, and flaky muscles furnish our table with one of the most delicious dainties; salted, dried, or otherwise conserved for future use, it affords a substantial and wholesome article of diet, for which a substitute could not readily be found. The tongue, which is always separated from the head when the fish is first caught, even epicures consider a delicacy; and tongues, salted or pickled along with the swimming-bladders, which are highly nutritious, being almost entirely pure gelatine, are held in much estimation by house-keepers, under the title of *tongues and sounds*. The sound or swimming-bladder of codfish, if rightly prepared, supplies an isinglass equal to the best Russian, and applicable to all the uses for which the imported is employed. The liver of the cod, when fresh, is eaten by many with satisfaction, but it is more generally reserved by fishermen for the sake of the large quantity of fine limpid oil which it contains. This is extracted and forms the well-known and highly valued *cod-liver oil* (which see). Sometimes the heads, after the tongues are cut out, and the gills are saved for bait, are thrown overboard on account of want of room, and because salting would not preserve them to any advantage. Yet the head, being almost entirely composed of gelatine, is when fresh the richest, and perhaps the most nutritive part of the fish. The fishermen, it is true, make use of it for their own nourishment, but the great mass is thrown into the sea—a circumstance we scarce reflect upon without regret, when we remember how many poor in various charitable institutions, and through the country generally, might be luxuriously fed with the waste. If vessels were provided with the requisite implements and fuel, these heads would furnish a large amount of strong and valuable fish-glue or isinglass that would well repay the trouble and expense of its preparation. The intestines of the codfish also yield a tribute to the table; the French fishermen, especially, prepare from them a dish somewhat similar, and not far inferior to the sounds. Finally, the ovaries or roes of the females are separated from their membranes, and the eggs, nicely pickled, afford an agreeable and gustful relish far more delicate and inviting to the palate than the celebrated Russian caviare. In addition to these usual modes of employing the different parts of our fish, the Norwegians, Icelanders, and Kamtschadales, pound up the backbones and other refuse parts, for the purpose of feeding their dogs and other domestic animals during the winter. Strange as such a diet may appear, it is stated as a well-established fact, that cows fed upon these pounded bones, mingled with a small quantity of vegetable matter, yield a larger supply and a better quality of milk than those supported upon more ordinary provender.

The usual mode of preserving codfish for commercial purposes is by salting them immediately after they are caught, having first removed the head, intestines, &c. Those which are carefully selected and salted with greater attention to their whiteness are usually called dun-fish, and bring a better price than such as are salted in bulk, with little regard to the discoloration caused by imperfect washing and draining before being packed. Where facilities are afforded for drying, by an adjacent shore, or by the construction of the vessel, cod are cured by drying alone, or with a very small quantity of salt. This process requires several days' exposure to sun and air, and, when skilfully conducted, keeps the fish for an indefinite period in a very desirable condition of whiteness and freshness, both peculiarly advantageous to the appearance of the fish at respectable tables. Cod thus cured are called stock-fish, and before being cooked require to be softened, by soaking in water and pounding with a wooden mallet.

The spawning season, on the banks of Newfoundland, begins about the month of March, and terminates in June; consequently the regular period of fishing does not commence before April, on account of the storms, ice, and fogs; and indeed, many fishermen consider the middle of May as sufficiently early. After the month of June cod commence their migrations to other quarters, and, of course, the fishing is suspended until the ensuing season.

The common or Bank cod (in French *cabeliau* or *morue*) varies in size and weight according to its age and the season of the year. The average length is about 2½ or 3 feet, and the weight between 30 and 50 lbs. Single cod have been caught weighing three times as much, measuring 5½ feet in length; but such specimens are uncommon, the greater number approaching the average above given. The colour is a yellowish-gray on the back, spotted with yellowish and brown; the belly white or reddish, with golden spots in young individuals. The fins are yellowish, with the exception of the anal, which are grayish; the head is large and flattened, with an enormous gape to the mouth; the upper jaw projects beyond the lower, which has a cirrhus or beard about the length of a finger; the eyes are very large, and veiled by a transparent membrane; the scales are of large size; first ray of the first anal fin not articulated and spinous. Among the fishes of the cod genus which are found round the British coasts are *Gadus æglefinus*, the common haddock; *G. merlangus*, the whiting; *G. luscus*, the whiting pout; *G. minutus*, the power cod; *G. pollachius*, the pollack; *G. virens*, the coal-fish; *G. poutassou*, Couch's whiting. Among American species there have been enumerated ten that are brought to the New York market, and are caught on the coasts adjacent. They are named as follows:—*Gadus morrhua*, Bank cod; *G. callarias*, dorse cod; *G. tomcodus*, tomcod; *G. æglefinus*, haddock; *G. blennoides*, blennoid cod; *G. purpureus*, New York pollock; *G. merluccius*, hake; *G. tenuis*, slender cod; *G. longipes*, codling; *G. punctatus*, spotted cod. The whole process of cod-fishing is highly interesting, but the briefest description of it would require far more space than can be afforded here. The importance of this fishery, and the great national interests which it involves, has made it a fruitful source of diplomatic discussion, and led to the establishment of various regulations, to which all are obliged to conform who participate of its advantages.

COD, CAPE. See CAPE COD.

CODE, in jurisprudence, is a name given, by way of eminence, to a collection of laws.

CODE CIVIL, or CODE NAPOLEON. One of the first labours of Bonaparte, when consul, was to give France a code. By a consular decree, dated 24th of Thermidor, year viii. (July 13, 1800), a committee was instituted 'to compare the order which had been followed in the preparation of the *projets* for a civil code hitherto published, to determine the plan which the committee shall think best to adopt, and to discuss the chief principles of civil legislation.' Portalis, Tronchet, Bigot-Préameneu, Maleville, and the minister of justice formed this committee. In the following year, 1801, these commissioners reported a draft of a civil code, which was, in the first instance, submitted to the Court of Cassation (of errors; see CASSATION, COURT OF), and the various courts of appeal. With the reports of the judges of these courts the draft was submitted to the council of state, over which the consul Bonaparte presided, and in which every part was thoroughly discussed. In the work entitled Conférence du Code Civil, avec la Discussion particulière du Conseil d'État et du Tribunat, &c. (eight vols. 12mo, Paris, 1805), a detailed and very carefully prepared report of these discussions is contained. Each article, after having been discussed in this body, was presented to the tribunate, where it underwent another discussion, and was returned to the council of state as adopted, rejected, or amended. Of the five codes prepared in this way, namely, the *Code civil*, published in 1804; the *Code de procédure civile*, published in 1806; the *Code de commerce*, published in 1807; the *Code d'instruction criminelle*, published in 1808; and the *Code pénal*, published in 1810; the first was called by way of eminence, by a law of the 3d Sept. 1807, *Code Napoléon*. At the restoration its name was changed back to *Code civil*, and during the time of the second empire it was again called *Code Napoléon*. It is divided into 2281 paragraphs, which are numbered, and consist of a few lines each. The work is divided into three books (*livres*); each book into a certain number of titles; each title is comprised in one or more chapters. A preliminary title, 'On the Publication, Effects, and Application of the Law in General,' precedes the whole. The first book is entitled 'Of Persons,' and in eleven titles treats, 1, of the enjoyment and privation of civil rights; 2, of civil acts, such as the registry of births, marriages, and deaths; 3, of domicile; 4, of absentees; 5, of marriages; 6, of divorce; 7, of the relations of father and son; 8, of adoption and official guardianship; 9, of the paternal power; 10, of minority, guardianship, and emancipation; 11, of majority, of guardianship of persons of age (interdiction), and judicial counsel. The second book is entitled 'Of Property and the Different Modifications of Ownership,' and in four titles treats, 1, of the distinction of property into real and personal (*immeubles et meubles*); 2, of ownership; 3, of usufruct, of use and habitation; 4, of servitudes (easements, *des servitudes ou services fonciers*). The third book is entitled 'Of the Different Modes of acquiring Property,' and in twenty titles treats, 1, of successions; 2, of donations *inter vivos* and testaments; 3, of contracts, or conventional obligations in general; 4, of engagements formed without a convention; 5, of the contract of marriage, and the rights of the parties respectively; 6, of sale; 7, of exchange; 8, of the contract of letting to hire; 9, of partnership; 10, of loan; 11, of deposit and sequestration; 12, of contracts connected with chance (*aléatoires*, such as wagers and life-rents); 13, of powers of attorney; 14, of becoming security; 15, of transactions; 16, of bodily duress in civil cases; 17, of furnishing security; 18, of mortgages; 19, of taking and setting off by execution; 20, of prescriptions. It would be necessary to give the heads of the chapters also, in order to present a clear view of the code, but our limits do not permit it. The work already quoted, Conférence du Code Civil, is indispensable to a complete understanding of the code, because it gives the history of each law. It first presents each article in the code as finally adopted. Next follow the different forms and draughts of each article discussed in the council of state, with the report of the discussions. To this succeed the observations made in the section of legislation of the tribunate. We learn from this work how active a part Napoleon took in the formation of the code, as his remarks are given as well as those of the others, and he was present during almost the whole of the debates. Under the first empire the adoption of the *Code Napoléon* was made obligatory on all the countries subject to the French. After the battle of Leipzig, in 1813, which freed Germany from the power of France, it ceased to be obligatory in the German states, but it continued to influence considerably their legislation. At present this code is recognized in the Kingdom of Belgium (with some modifications), in the grand-duchy of Baden, in the Kingdom of Italy, and elsewhere in Europe. In America it has served as a model to the Code of Louisiana and the Code Henri. See LOUISIANA (CODE OF), and CHRISTOPHE.

CODEIA, or CODEINE (*kōdeia*, Greek, a poppy-head), $C_{18}H_{21}NO_3$, or $(C_{18}H_{21}NO_3)_2$, one of the numerous bodies contained in opium, which was discovered by Robiquet in 1832. To separate it from the meconic acid, with which, like morphia, it exists combined in opium, the concentrated aqueous extract of opium is mixed with chloride of calcium, and the solution, drained from the precipitated meconate of calcium, yields on standing the hydrochlorides of morphia and codeia, in crystals. These crystals are then dissolved in water, decolorized, and ammonia added, upon which the morphia precipitates, the codeia remaining dissolved. The solution is then repeatedly crystallized to free the codeia hydrochloride from the ammonia salt, which is the more soluble, and the codeia hydrochloride is finally decomposed by potash and the codeia purified and crystallized. Thus obtained codeia is a white solid, readily soluble in water, to which it imparts a strong alkaline reaction. It is soluble in alcohol and in ether, insoluble in potash. From a solution of it in dry ether it crystallizes in small modified rectangular octahedra, which are anhydrous, but from an aqueous solution it deposits in trimetric crystals containing one part of water. Codeia is a powerful base, it neutralizes the acids and precipitates the oxides from solutions of metallic salts. With the acids it forms a number of salts which dissolve more or less readily in water and are crystalline. By the action of chlorine, bromine, and nitric acid, several substitution compounds are formed which are possessed of basic properties. Substitution compounds containing alcohol radicles are also known. Codeia and its salts have a bitter taste, and are similar in their action to morphia and its compounds. In small doses they produce sleep; in larger doses nausea, and in quantities above 6 or 7 grains they are poisonous. It is remarkable, however, that the poisonous effects of codeia are changed or diminished, or altogether destroyed, by introducing into it alcohol radicles. Thus while 14·5 grains of pure dry codeia, in one experiment, produced death in less than two hours, a quantity of iodide of methyl-codeia equal to 157 grains of dry codeia, produced paralysis, from which the animal operated on recovered in about three hours. This modification of active properties is not confined to codeia, but is exhibited by strychnia and some others, when alcohol radicles are introduced into them.

When codeia is acted on by a dehydrating agent, water is removed, and a new base called *apocodeia* ($C_{18}H_{19}NO_2$) is produced. It is a reddish uncrystallizable gummy mass, insoluble in water, but soluble in alcohol and ether; its hydrochloride, however, is crystalline. It is a mild emetic. By the action of phosphoric acid codeia undergoes *polymerisation*, that is, it yields bodies the formula of which are multiples of the formula of codeia itself. These bodies are very markedly distinguished from one another both in their chemical and physical properties and in their physiological effects.

CODE OF JUSTINIAN. See CIVIL LAW.

CODE OF MARITIME SIGNALS. See SIGNALS.

CODEX, with the ancients, the trunk of a tree stripped of the bark. Before the invention of paper wooden tablets covered with wax, which were written on with the style, and put together in the shape of a book, were called *codex*. The word was afterwards retained, in times when paper was used for writing, to denote a large book. Thus important works, particularly old manuscripts of poets, historians, &c., which had been preserved, were called *codices manuscripti*. (See MANUSCRIPTS.) In like manner a collection of laws was called *codex*, with the addition of the name of the sovereign under whom, or of the person by whom it had been compiled, as *Codex Gregorianus*, *Codex Theodosianus*, *Codex Carolinus*.

Codex rescriptus (Latin, a re-written codex). This name is given to ancient manuscripts, which, in the middle ages, were used, after the original writing had been in a great measure effaced, for the copying of other works, generally ecclesiastical treatises. Thus the Institutions of Gaius, discovered by Niebuhr, at Verona, in 1816, and published by Göschen in 1821, is a *codex rescriptus*. Some skill is required to read the ancient letters under the others. The Greek name for *codex rescriptus* is *palimpsest*, now more frequently used. The Holy Scriptures themselves have been sometimes effaced to make way for homilies and legends. One of the oldest manuscripts of the New Testament, designated by the letter C, is a *codex rescriptus*, on which the works of Ephraem Syrus have been written. See PALIMPSEST.

CODEX ALEXANDRINUS. See ALEXANDRIAN VERSION.

CODEX SINAITICUS, the name given to a very ancient and valuable manuscript of the Greek Septuagint version of the Old Testament (including the Apocrypha), the whole of the New Testament, the Epistle of Barnabas, and a part of the Shepherd of Hermas, discovered in the monastery of St. Catherine, on Mount Sinai, by the German scholar Tischendorf, on the 4th of February, 1859, while travelling in the East by the desire of the Czar Alexander II. When the discovery was made Tischendorf endeavoured to persuade the monks to make a present of the manuscript to the czar, and although he was not immediately successful, he was allowed to take it to St. Petersburg on loan. Ultimately, in 1869, the manuscript was formally presented to the czar as Tischendorf had desired. In 1860 an account of the manuscript was published by the discoverer at Leipzig. It is written on parchment in four columns, in early uncial characters, and bears every mark of being of great antiquity, perhaps even older than the Vatican MS., which, before the discovery of the Sinaitic MS., was recognized as the oldest known manuscript of the Old and New Testaments. It is assigned by Tischendorf himself to the fourth century. The Old Testament in this manuscript is defective, but the New Testament is complete, not a word being wanting, which is the more remarkable, inasmuch as it is the only manuscript of the New Testament which is complete. From this circumstance, as well as from its great age, it acquires a value in relation to the text of the New Testament, which can scarcely be overestimated. Two gaps in the Old Testament part of the manuscript are curiously supplied by another manuscript which Tischendorf had discovered in the same monastery in 1844, and which he had brought to Germany and named *Codex Friderico-Augustanus*, in honour of the King of Saxony. From this coincidence, as well as the general resemblance of the two manuscripts, it is inferred that the last-named manuscript is really a part of the *Codex Sinaiticus*, which is generally believed to be the case. A splendidly got up fac-simile of the manuscript was published by Tischendorf under the auspices of the czar at St. Petersburg, in four volumes, folio, towards the end of 1862. This was followed in 1863 and 1864 by two smaller editions of the New Testament part of it. Tischendorf has since published the following works referring more or less to this manuscript: Appendix Codicum Celeb. Sinaitici, Vaticani, Alexandrini (Leipzig, 1867); New Testament, with Introduction and various Readings from the three most celebrated Manuscripts of the Original Greek Text (Leipzig, 1869); and Die Sinai-Bibel, ihre Entdeckung, Herausgabe, und Erwerbung (Leipzig, 1871).

CODEX VATICANUS, an ancient Greek MS. of the Old and New Testaments, so-called from being contained in the Vatican Library at Rome, where it was placed early in the sixteenth century. It is written on thin vellum, in small uncial characters. In the greater part of the manuscript there are three columns to a page, and this fact is regarded as one among other indications that it is later than the Sinaitic manuscript, which has four columns to a page. The manuscript is assigned to the fourth century, and until the discovery of the Sinaitic, was regarded as the best manuscript of the Old and New Testaments. The greater part of Genesis in the Old Testament, and the whole of the pastoral epistles and the Revelation in the New Testament are wanting. The first collation of this MS. was by Bartolocci, in 1669. An edition of it by Cardinal Mai was published in 1857, after having been nineteen years in print without being published; but it did not satisfy the expectations of scholars. A fac-simile of it was published in 1868.

CODICIL, in law, a supplement to a will, to be considered as a part of it, either for the purpose of explaining or altering, or of adding to or subtracting from the testator's former disposition. A codicil may be annexed to a will, either actually or constructively. It may not only be written on the same paper, or affixed to or folded up with the will, but may be written on a different paper, and deposited in a different place. In general the law relating to codicils is the same as that relating to wills, and the same proofs of genuineness must be furnished by signature, and attestation by witnesses. A man may make as many codicils as he pleases, and, if not contradictory, all are equally valid.

COD-LIVER OIL. As its name imports, this oil is extracted from the livers of different kinds of cod—the *Gadus morrhua* being specified in the pharmacopœia—and allied species. It has a fishy taste and odour, is insoluble in water, but dissolves in ether, and is colourless or pale yellow. The tint, however, depends on the mode of preparation, some kinds being pale brown, and others dark brown. The finest and palest oil is got from fresh and carefully cleaned liver, the oil being extracted either in the cold or by a gentle heat. The darker kinds are got at a higher temperature, and often from the livers in a putrefying state. Only the pale oils are used in medicine, the dark oils are too rank and acrid, and they are only used in dressing leather. The oil is prepared in Great Britain, in Newfoundland, and in Norway, and it has also been prepared in Iceland.

Cod-liver oil has a specific gravity of 0·93. It is a somewhat complex substance, but the main ingredients appear to be olein and margarin. Acetic, butyric, and other acids are also present, and to these the oil may owe some of its odour. It contains besides biliary matters, a peculiar body called *gaduin*, and inorganic substances, including minute quantities of iodine, bromine, sulphur, and phosphorus. It is questioned, however, whether iodine and bromine are constant constituents. This oil is now a recognized agent in the treatment of rheumatism, gout, scrofula, and especially of consumption. It was introduced into Great Britain in 1841 by Dr. Bennet, although it was previously known on the Continent. Different opinions have been held as to both the extent and cause of its efficacy, but there seems to be no doubt of its value in particular instances.

CODOGNO, a town in Italy, in a fertile district between the Po and Adda, 17 miles S.E. of Lodi, with 9632 inhabitants. It consists of spacious well-built streets, and has a large trade in Parmesan cheese and wheat. The French defeated the Austrians here in 1796.

CODRINGTON, SIR EDWARD, Admiral, G.C.B., grandson of Sir Edward Codrington, of Dodington, Gloucestershire, and born in 1770. He entered the navy as midshipman in 1783, became lieutenant in 1793, and the following year received the appointment of captain. He obtained a gold medal for his services at the battle of Trafalgar, took part in the Walcheren expedition, and was afterwards actively employed both in the Peninsular and second American wars. In 1821 he became vice-admiral. His name is principally famous in connection with the battle of Navarino, where he commanded the united squadrons that overthrew the Turkish fleet in 1827. Sir Edward Codrington was elected as member of Parliament for Devonport, first in 1832, and afterwards in 1835 and 1837. In the last-named year he became full admiral. He died in London on 28th April, 1851.

CODRUS, son of Melanthus, was the seventeenth and last King of Athens. The tradition tells us that during his reign Attica was attacked by the Dorians, or, according to some, by the inhabitants of the Peloponnesus, or the Thracians. The assailants, on inquiring of an oracle what would be the result of their incursion, received for answer that they would be successful if they avoided killing the Athenian king. Codrus, becoming acquainted with this answer, resolved to sacrifice himself for his country. He disguised himself in a peasant's dress, entered the enemy's camp, provoked a quarrel with the soldiers, and was slain. The Athenians, upon hearing of this, sent a herald to demand the body of their king. The courage of the assailants was so damped that they retired without striking a blow. In honour of their patriotic monarch the Athenians abolished the royal dignity, substituting that of a responsible archon, esteeming no one worthy to be the successor of Codrus. They also used his name as a common term to express a man of distinguished excellence.

COEFFICIENT, Alegebraic. This term is used without very great precision, but without any ambiguity whatever. It always denotes a multiplier of a quantity whose coefficient is spoken of. Thus, in the expression $3ax$ we should understand as the coefficient of x $3a$, and as the coefficient of ax 3. It is customary to speak of the *numerical* coefficient and of the *literal* coefficient of an expression. 3 would of course be the numerical coefficient, and a the literal coefficient of the above expression.

COEFFICIENT, Differential. See Differential Calculus.

COEFFICIENTS OF FRICTION. See Friction.

COEHORN, Menno, Baron Van, an engineer, born 1641, near Leeuwarden, in Friesland. His father, a distinguished officer, early inspired him with an inclination for military science, which he studied thoroughly. In his sixteenth year he entered the service as captain. He distinguished himself at the siege of Maestricht (1673), and at the battles of Senef, Cassel, St. Denis, and Fleurus, and soon rose to the rank of a colonel. During the siege of Graves he made use for the first time of the small mortars, called in honour of their inventor *coehorns*, used for throwing grenades. In 1675, not having received the command of a regiment, which had been promised him, he negotiated with Louvois for entering into the French service. The Prince of Orange, however, detained his wife and eight children as hostages, and having thus made him return, secured his attachment by acts of favour. In the war of 1689, against France, he again distinguished himself. His defence of Fort William, in 1692, which he himself had planned, against the attacks of Vauban, attracted much attention. Both commanders displayed all their talents. Coehorn was finally wounded, and had but 150 men left able to do duty, when he surrendered the fort, June 23, 1692. In 1702 he destroyed the French lines near St. Donat. In the same year he published at Leeuwarden his new theory of fortification. In 1703 he directed several sieges. In 1704 Marlborough invited him to the Hague, to concert a plan of operations, where he died, March 17, 1704. Coehorn was a man of good principles and honourable feelings and habits. He fortified almost all the strong places in Holland. Bergen-op-Zoom he considered his master-work. His system, and that of Vauban, are entirely different. Vauban operated by manœuvres, and by the skilful direction of his ordnance and his men saved both, and wearied and divided the forces of the enemy; Coehorn crushed by an overpowering mass of artillery and of men, and sacrificed both for a rapid and powerful effect.

CŒLENTERATA. The zoophytes or radiate animals of older writers included, among others, the *Actinia* or sea-anemone, the coral, the fresh-water *Hydra*, the sea-firs (*Sertularia*), and the *Medusidæ* or jelly-fishes. These forms were united under the common designation *Cœlenterata* by Frey and Leuckart, and recent observations tend to include the sponges likewise in the same class. Omitting the sponges, however, as their relations are still uncertain, the Cœlenterata may be defined as animals whose body wall, consisting of two layers, ectoderm and endoderm, incloses a cavity which has only one external aperture, and which discharges the function at once of digestive and circulatory organ. The outer surface may secrete a horny sheath, as in the sea-firs, or may develop in its substance the hard calcareous skeleton of the corals. The Hydra, if divided transversely at any point, shows only a single circular boundary; but the Actinia, if similarly treated, is seen to consist of an external and an internal circle, between which radial partitions pass. This is due to the fact that the oral margins are prolonged inwards for a short distance as a funnel, which terminates by a truncated open end: the matters received into the funnel and then digested circulate in the compartments outside the funnel, while the effete portions are rejected by the mouth. The Hydra and Actinia, which are the simplest representatives of the two principal divisions of the class, are at first sight alike in their perfect radial arrangement; but in the Actinia bilateral symmetry may be recognized, in so far as the presence of a tubercle within the tentacular circlet indicates the point through which a section would divide equally the cylindrical animal. The structure of the coral will be given under that heading. The Venus' girdle (*Cestum Veneris*), the spherical *Cydippe*, and the *Beroë*, are the commonest members in our seas of the *Ctenophora*, whose locomotive organs consist of cilia arranged on definite bands which divide the surface. The *Hydrozoa* comprise a very varied assemblage of fixed or free-swimming forms, of single animals or clusters aggregated into a compound mass by a process of gemmation, the various members of the group giving off buds which remain in organic connection with the parent mass. This, the simplest mode of multiplication, is obviously asexual, and the development of ova may take place at some part of the compound mass. But the most interesting phenomena are presented by those forms which illustrate what is known as alternate generations, when from the egg is produced an organism which is unlike that which gave it birth, but whose progeny exactly repeats the form whence the egg was derived. Thus from the egg may be produced a fixed compound structure like the sea-fir, from which a free-swimming zoöid is given off; and in this an egg is produced, whence the fixed form is again developed. These free-swimming zoöids are the familiar umbrella-like discs of our jelly-fishes, and these are either *gymnophthalmatous* or naked-eyed, the eye-spots on the margin of the disc being exposed; or else these spots are covered by a fold of the body-wall, as in the covered-eyed or *steganophthalmatous* Medusæ. These free-swimming forms move by the contraction of their umbrella, but the air-sacs developed in the Portuguese man-of-war and the like assist or supersede the muscular action of the discs. The majority of these Medusæ are known to be merely the sexual phases in the alternate generations, and the difficulty of their determination may be guessed from the fact that the one 'generation' may consist of zoöids 7 feet in circumference, while that from which they proceeded is only ½ inch in height. The researches of Allman have shown a beautiful series of gradations connecting the apparently quite dissimilar members of the group. Thus the umbrella-like zoöids may remain in connection with the parent mass of which they are buds, and the free-swimming zoöids are shown to be merely detached reproductive organs.

CŒLE-SYRIA (that is, *Hollow Syria*), the ancient name of the large valley lying between the Lebanon and Anti-Lebanon mountain ranges in Syria. The valley is about 100 miles in length. Near its centre are the ruins of Baalbek or Heliopolis, and near the ruins rise the rivers Orontes and Litany, which water and fertilize the plain. The name also at one time included all the country (except Judea and Phœnicia) extending from Seleucis to the confines of Egypt and Arabia.

CŒNOBITE. See ANCHORITE.

COETHEN, a town of Germany, till 1853 capital of the former duchy of Anhalt-Coethen, now in the duchy of Anhalt, in a fertile and attractive district on the Ziethe, about 80 miles south-west of Berlin. It consists of the Old and the New Town and several suburbs; has a fine Protestant cathedral church in the Gothic style, with old glass-paintings and a fine organ; the former ducal residence with library, picture-gallery and museum; a gymnasium, normal and several other schools. There are manufactures of machinery and metal goods, and various other industries. Beet-root sugar is a staple article of commerce. The town dates back to the tenth century. Pop. (1885), 17,473; (1895), 20,463.

COFFEE is the seed of an evergreen shrub, which is cultivated in hot climates, and is a native of Abyssinia, and probably of Arabia. This shrub (*Coffea Arabica*) is from 15 to 20 feet in height, and belongs to the Rubiaceæ. The leaves are green, glossy on the upper surface, and the flowers are white and sweet-scented. The fruit is of an oval shape, about the size of a cherry, and of a dark-red colour when ripe. Each of these contains two cells, and each cell a single seed, which is the coffee as we see it before it undergoes the process of roasting.

Great attention is paid to the culture of coffee in Arabia. The trees are raised from seed sown in nurseries, and afterwards planted out in moist and shady situations, on sloping grounds, or at the foot of mountains. Care is taken to conduct little rills of water to the roots of the trees, which at certain seasons require to be constantly surrounded with moisture. As soon as the fruit is nearly ripe, the water is turned off, lest the fruit should be rendered too succulent. When the fruit has attained its maturity, cloths are placed under the trees, and upon these the labourers shake it down. They afterwards spread the berries on mats, and expose them to the sun to dry. The husk is then broken off by large and heavy rollers of wood or iron. When the coffee has been thus cleared of its husk, it is again dried in the sun, and, lastly, winnowed with a large fan, for the purpose of clearing it from the pieces of husks with which it is intermingled. A pound of coffee is generally more than the produce of one tree; but a tree in great vigour will produce 3 or 4 lbs.

The best coffee is imported from Mocha, on the Red Sea. This kind, which is denominated *Mocha* and *Turkey coffee*, is of a better quality than any which the European colonies are able to raise, owing, as it is supposed, to the difference of climate and soil in which it grows. It is packed in large bales, each containing a number of smaller bales, and, when good, appears fresh, and of a greenish-olive colour. Next in quality to the Mocha coffee may perhaps be ranked that of Southern India and that of Ceylon, which is strong and well flavoured, and used to be produced in much greater quantities than at present. Java also produces large quantities of excellent coffee. Brazilian coffee though produced more abundantly than any other stands at the bottom of the list. Liberian coffee may also be mentioned.

Palgrave (Central and Eastern Arabia, i. 424) maintains that the best coffee is that of the Yemen, commonly entitled 'Mokha,' from the main port of exportation. But he says that an inappreciable quantity of the Yemen berry ever finds its way westward of Constantinople. 'Arabia itself, Syria, and Egypt, consume fully two-thirds, and the remainder is almost exclusively absorbed by Turkish and Armenian œsophagi. Nor do these last get for their limited share the best or the purest. Before reaching the harbours of Alexandria, Jaffa, Beyrouth, &c., for further exportation, the Mokhan bales have been, while yet on their way, sifted and resifted grain by grain, and whatever they may have contained of the hard, rounded, half-transparent, greenish-brown berry, the only one really worth roasting and pounding, has been carefully picked out by experienced fingers; and it is the less generous residue of flattened, opaque, and whitish grains which alone, or almost alone, goes on board the shipping. So constant is this selecting process, that a gradation regular as the degrees on a map may be observed in the quality of Mokha, that is, Yemen, coffee even within the limits of Arabia itself, in proportion as one approaches to or recedes from Wadi Nejrān and the neighbourhood of Mecca, the first stages of the radiating mart. . . . This berry quits its native land on three main lines of export—that of the Red Sea, that of the inner Ḥejāz, and that of Ḳaseem. The terminus of the first line is Egypt, of the second Syria, of the third Nejed and Shomer. Hence Egypt and Syria are of all countries without the frontiers of Arabia the best supplied with its specific produce, though under the restrictions already stated; and through Alexandria or the Syrian seaports Constantinople and the north obtain their diminished share. But this last stage of transport seldom conveys the genuine article, except by the intervention of private arrangements and personal friendship or interest. Where mere sale or traffic are concerned, substitution of an inferior quality, or an adulteration almost equivalent to substitution, frequently takes place in the different storehouses of the coast, till whatever Mokha-marked coffee leaves them for Europe and the West, is often no more like the real offspring of the Yemen plant than the logwood preparations of a London fourth-rate retail wine-seller resemble the pure libations of an Oporto vineyard.

'The second species of coffee, by some preferred to that of Yemen, but in my poor opinion inferior to it, is the growth of Abyssinia; its berry is larger, and of a somewhat different and a less heating flavour. It is, however, an excellent species. . . . With this stops, at least in eastern opinion and taste, the list of coffee, and begins the list of beans.

'Here first and foremost stands the produce of India, with a little, similar to it in every respect, from the plantations of 'Omān. This class supplies almost all coffee-drinkers. from the neighbourhood of Dafar to

Basrah, and thence up to Bagdad and Mosoul; Arabs, Persians, Turks, Curdes, be they who they may, have there no other beverage. To one unaccustomed to what Yemen supplies, the Indian variety may seem tolerable, or even agreeable. But without any affectation of virtuoso nicety, I must say that for one fresh arrived from Nejed and Kaseem it is hardly potable. The distorted and irregular form of the berry, its blackish stain, and above all the absence of the semi-transparent alabaster-like appearance peculiar to the good Yemenite variety, renders the difference between the two kinds appreciable to the unassisted eye, not only to the palate. . . . American coffee holds, in the judgment of all orientals, the very last rank; and the deterioration of this product in the New World from what is in the Old, is no less remarkable than that observed in rice, tea, &c., and is of an analogous character.'

The history of the cultivation of coffee by European nations, in their colonies, is singular. The old Dutch East India Company carried on some traffic with the Arabian ports on the Red Sea; and about the year 1690 the Dutch governor-general of India, Van Hoorne, caused some ripe coffee-seeds to be brought to Java; they were planted, grew, and produced fruit. He sent a single plant home from Batavia to Nicholas Witsen, the governor of the East India Company, which arrived safe, was planted in the botanic garden of Amsterdam, where it prospered, produced fruit, and the fruit young plants. From the Amsterdam garden plants were sent to the Dutch colony of Surinam, and the planters entered on the cultivation of coffee in 1718. The authority for this is the celebrated physician and botanist, Boerhaave, in his Index of the Leyden Garden. In ten years after its cultivation in Surinam it was introduced from that colony by the English into Jamaica, and by the French into Martinique. The first coffee plant cultivated in Brazil, now the greatest producing country in the world, was reared by a Franciscan monk of the name of Vellosa, in the garden of the convent of St. Antonio, near Rio Janeiro; it throve, and the monk presented its ripe fruit to the viceroy Lavrado. He judiciously distributed it to the planters, who commenced the cultivation in 1774. It is estimated that Brazil now produces 400,000,000 lbs. coffee annually. From Java the coffee plant was conveyed to Sumatra, to Celebes, to the Philippines, and in more modern times to Malabar, Mysore, and Ceylon. The few coffee-berries which were brought from Mocha to Batavia were the parents of the vast quantity now produced; and all the coffee that is consumed, save the trifle yielded by Arabia, has the same origin.

Coffee as an article of diet is of but recent introduction. To the Greeks and Romans it was wholly unknown. It was first introduced into England by a Turkey merchant named Edwards in 1652, and his Greek servant, named Pasqua, first opened a coffee-house in London. In 1660 an act was passed imposing a duty of fourpence per gallon to be paid by the maker upon all coffee made and sold; three years later coffee-houses were directed to be licensed by the magistrates at quarter-sessions. In 1671 an Armenian named Pascal set up a coffee-house in Paris, but meeting with little encouragement, he removed to London. He was succeeded by other Armenians and Persians, who were equally unsuccessful. It was not until some Frenchman conceived and carried out the idea of fitting out spacious and elegant saloons where coffee, along with chocolate, tea, and other refreshments, were sold, that the use of the beverage became fashionable. The early history of coffee is obscure. Its use is said to have been introduced from Abyssinia into Persia, and thence to have been communicated in the fifteenth century to a Mohammedan priest at Aden, who, having found that its use cleared the intellect, was exhilarating, and at the same time prevented drowsiness, recommended its use to his dervises, with whom he passed the night in prayer. From Aden it was communicated to Mecca, where first the pilgrims, or Hadjis, and then the rest of the people, adopted it; and from Arabia it passed over to Grand Cairo in Egypt, where, in 1511, its use was prohibited, from a belief that it was intoxicating, and inclined to things forbidden by the Koran. But the Sultan Causon having removed the prohibition, the use of coffee passed along the coast of Syria to Constantinople. Here the dervises attempted to raise a clamour against it, by quoting from the Koran that coffee is not of the number of things created by God for food. Accordingly, the mufti ordered all the coffee-houses to be shut up, but his successor declaring that coffee was not forbidden, they were again opened. During the war in Candia, the coffee-drinkers and newsmongers having made too free with politics, the Grand-vizier Cuproli suppressed the coffee-houses in Constantinople. However, at the present day the Turks indulge immoderately in the use of coffee. There is a sort of coffee used in Turkey not known in this country, which they call the *sultan's coffee*, from being used in the seraglio. This coffee is made from the external part of the berry, and is never imported into the West. The beans or seeds alone are known in England, where the liquor on its first introduction was called the syrup of Indian mulberries.

The excellence of coffee depends in a great measure on the skill and attention exercised in roasting it. If it be too little roasted it is devoid of flavour, and if too much it becomes acrid, and has a disagreeable, burned taste. In Europe it is usually roasted over a charcoal fire in a cylindrical tin box perforated with numerous holes, and fixed upon a spit, which runs lengthwise through the centre, and is turned by a jack or by the hand. The coffee-roaster introduced by Law is a globular vessel with a double motion, and is heated by an atmosphere of hot air. By this apparatus the roasting is made much more uniform, and the flavour is thereby improved. Coffee is used in the form either of an infusion or decoction, of which the former is decidedly preferable, both as regards flavour and strength. Coffee, as very commonly prepared by persons unacquainted with its nature, is a decoction, and is boiled for some time, under a mistaken notion that the strength is not extracted unless it be boiled. But the fact is just the reverse. The fine aromatic oil which produces the flavour and strength of coffee is dispelled and lost by boiling, and a mucilage is extracted at the same time, which also tends to make it flat and weak. The best modes are to pour boiling water through the coffee in a biggin or strainer, which is found to extract nearly all the strength; or to pour boiling water upon it and set it upon the fire, not to exceed ten minutes. Prepared in either way, it is fine and strong. There are coffee-machines in which the water is boiled, and the steam penetrates the coffee and extracts, to a great degree, the fine aroma. Immediately after, the boiling water is poured over it. Thus the best coffee is made. As we have already said, in Europe coffee is generally roasted in a cylinder; in Asia, however, open pans or tin plates are used, and, if the time allows, a boy is employed, who picks out every bean when it has reached the right degree of brownness. The same is done by some French people. The second difference in the Asiatic way of preparing coffee is, that they do not grind but pound the beans. On the whole the Asiatic coffee is much better than the European, the difference being due in the first place to the coffee, but also to the different way of roasting. The Turks and Arabs boil the coffee, it is true, but they boil each cup by itself, and only for a moment, so that the effect is, in fact, much the same as that of infusion, and not like that of decoction. The Arabs do not take sugar or cream with the coffee, nor do the Turks. It improves the beverage very much to roast and grind the coffee just before it is used.

Palgrave gives the following description of the Arabic method of making coffee:—In a corner of the reception-room was a fire-place or furnace, 'formed of a large square block of granite, or some other hard stone, about 20 inches each way; this is hollowed inwardly into a deep funnel, open above, and communicating below with a small horizontal tube or pipe-hole, through which the air passes, bellows-driven, to the lighted charcoal piled up on a grating about halfway inside the cone. In this manner the fuel is soon brought to a white heat, and the water in the coffee-pot placed above the funnel's mouth is readily brought to boil.' In other parts of Arabia, however, wood is the fuel, and the fire-place is a hollow in the ground with a stone border and dog-irons. 'On the broad edge of the furnace or fire-place, as the case may be, stands an ostentatious range of copper coffee-pots, varying in size and form. . . . Behind the stove sits, at least in wealthy houses, a black slave. . . . His occupation is to make and pour out the coffee.' The slave begins the preparations for coffee 'by about five minutes of blowing with the bellows and arranging the charcoal, till a sufficient heat has been produced. Next he places the largest of the coffee-pots, a huge machine, and about two-thirds full of clear water, close by the edge of the glowing coal-pit, that its contents may become gradually warm while other operations are in progress. He then takes a dirty knotted rag out of a niche in the wall close by, and having untied it empties out of it three or four handfuls of unroasted coffee, the which he places on a little trencher of platted grass and picks carefully out any blackened grains or other non-homologous substances commonly to be found intermixed with the berries when purchased in gross; then, after much cleansing and shaking, he pours the grain so cleansed into a large open iron ladle and places it over the mouth of the funnel, at the same time blowing the bellows and stirring the grains gently round and round till they crackle, redden, and smoke a little, but carefully withdrawing them from the heat long before they turn black or charred, after the erroneous fashion of Turkey and Europe; after which he puts them to cool a moment on the grass platter. He then sets the warm water in the large coffee-pot over the fire aperture, that it may be ready boiling at the right moment, and draws in close between his own trouserless legs a large stone mortar, with a narrow pit in the middle, just enough to admit the black stone pestle of a foot long and an inch and a half thick, which he now takes in hand. Next, pouring the half-roasted berries into the mortar, he proceeds to pound them, striking right into the narrow hollow with wonderful dexterity, nor ever missing his blow till the beans are smashed, but not reduced into powder. He then scoops them out, now reduced to a sort of coarse reddish grit, very unlike the fine charcoal dust which passes in some countries for coffee, and out of which every particle of real aroma has long since been burned or ground. After all these operations, each performed with as intense a seriousness and deliberate nicety as if the welfare of the entire Djowf [the name of the place] depended on it, he takes a smaller coffee-pot in hand, fills it more than half with hot water from the larger vessel, and then shaking the pounded coffee into it, sets it on the fire to boil, occasionally stirring it with a small stick as the water rises, to check the ebullition and prevent overflowing. Nor is the boiling stage to be long or vehement; on the contrary, it is and should be as slight as possible. In the interim he takes out of another rag-knot a few aromatic seeds called heyl, an Indian product, but of whose scientific name I regret to be wholly ignorant, or a little saffron, and after slightly pounding these ingredients throws them into the simmering coffee to improve its flavour, for such an additional spicing is held indispensable in Arabia, though often omitted elsewhere in the East. Sugar, I may say, would be a totally unheard of profanation. Last of all, he strains off the liquor through some fibres of the inner palm-bark, placed for that purpose in the jug-spout, and gets ready the tray of delicate parti-coloured grass, and the small coffee-cups ready for pouring out. All these preliminaries have taken up a good half-hour.' The coffee is then handed round, the cups, which 'are about the size of a large egg-shell,' never being more than half filled. 'The beverage itself is singularly aromatic and refreshing, a real tonic, and utterly different from the black mud sucked by the Osmanli, or the watery roast-bean preparations of France.'

The Turks drink coffee at all times of day, present it to visitors both in the forenoon and afternoon; and the opium-eater lives almost entirely on coffee and opium. Beaujour, in his excellent work on Greece, tells of a *thériacophage* (an opium-eater) who drank more than sixty cups of coffee in a day, and smoked as many pipes. Coffee has been the favourite beverage of many distinguished men. Napoleon and Frederick the Great drank it freely; Voltaire liked it very strong; and Leibnitz drank it also during the whole day, but mixed with more than an equal quantity of milk. Throughout the continent of Europe it is generally drunk. In England, however, tea is a much more common drink, and the consumption of coffee does not seem to be increasing. In 1888 there were imported into Great Britain 949,329 cwts. of coffee; in 1898, 922,088 (value £3,589,988). The largest quantity comes from the Central American states, Colombia, and Brazil; considerable quantities also from India. Large quantities are exported from Britain to other countries, the total in 1898 amounting to 558,637 cwts.

As to the effects of coffee on the human body, it acts as a stimulant on the nervous and vascular systems, and thus causes a feeling of cheerfulness; it also assists digestion, and removes the accompanying langour. But in delicate and irritable nervous people it often occasions watchfulness and tremblings. Where it agrees, it removes headaches, exhilarates, and counteracts the effects of alcohol, opium, and narcotics. On the Continent coffee is much used as a remedy, and is sometimes administered with the addition of ice, which is said to increase its virtues.

It was formerly maintained that coffee, by hindering the consumption of tissue, enabled a person to do with less food. Recent experiments seem to prove that there is no foundation for this opinion, and that the apparent decrease of tissue waste, if it occur at all, is due to other causes. Coffee acts as a nervous stimulant, a property which it owes mainly to the alkaloid *caffeine* (which see). Good roasted coffee has been analyzed, and has yielded cellulose, caffeine, aromatic oils and resin, albuminous matter, gum, fat, and inorganic salts. From the way in which coffee is prepared for use, the strained infusion contains little or none of the albumen or what might be regarded as the nutritive part of the seeds, but only the caffeine, soluble salts, colouring matter, and the oil which gives the coffee its fine odour. The caffeine is separated by an operation already described. Its physiological effects have also been tried, and these show that it is a very active poison. The administration of a few grains by injection under the skin is followed by tetanus, paralysis, and more localized symptoms of nervous derangement, and lastly by death. Similar effects, though possibly not so powerful, are observed when a very strong infusion of coffee itself is used. There seems to be no doubt, therefore, that the true reason of the great consumption of coffee as a beverage is its stimulating and not its nutritive power.

COFFER-DAM, a water-tight inclosure round a space where it is intended to found the pier of a bridge, quay, &c., so constructed that the water may be pumped out of it and the masonry executed 'in the dry'. It is formed of one or more rows of piles (usually two), between which clay is put. The piles, generally driven close together, are sometimes grooved and tongued; but if the water be not very deep the piles are placed some distance apart, and boards let into the grooves. Of course great care must be taken that no water can enter at the joints or at the junction with the natural soil, and that the structure is sufficiently strong to resist the great pressure of water from without. If the bottom is of rock, and piles cannot be driven, coffer-dams may be formed of two parallel stone walls, the intervening space filled up with clay. Iron caissons are also used instead.

COFFIN. Coffins were used by the ancients mostly to receive the bodies of persons of some distinction. Among the Romans it was latterly the almost universal custom to consume the bodies with fire, and deposit the ashes in urns. Even at the present time coffins are not used in the East, either by Mohammedans or Christians. In Egypt coffins seem to have been used in ancient times universally. They were of stone, earthenware, glass, wood, or a kind of pasteboard made by gluing cloth together. (See Sarcophagus.) Coffins among Christians were probably introduced with the custom of burying. (See Burying-places.) It has been often proposed that they should be made with a hole opposite the place of the mouth of the body, so as to allow breathing in case of revival. Of course it would be necessary, at the same time, to let the coffin stand for some days in a convenient place, as is the custom in some parts of Germany. It has recently been proposed to employ coffins of wicker-work, while some strenuously advocate the burning of all dead bodies. See Cremation.

COFRE DE PEROTE, a mountain of Mexico, about 1 mile from the town of Perote, and 70 miles north-west of Vera Cruz. It is 13,414 feet high. The English name is the *Four Parts*, or the *Square Mountain*. It is formed of basaltic porphyry.

COGGESHALL, a town of England in the county of Essex, 42 miles N.E. London, on the left bank of the Blackwater. The place was once famous for the manufacture of a kind of baize, celebrated under the name of 'Coggeshall whites', and silk and fine velvet were manufactured to a considerable extent, but these industries have disappeared, the making of tambour lace, clothing, gelatine, isinglass, and brewing taking their place. The hamlet of Little Coggeshall is on the opposite side of the Blackwater, which is crossed here by an ancient bridge of three arches, said to have been built by King Stephen, who founded here also an abbey for Cistercians. Pop. (1891), 3906.

COGNAC, a town in France, in the dep. and on the left bank of the river Charente, 22 miles W. Angoulême; (1896), 18,932 inhabitants. It stands pleasantly on a hill, crowned by the remains of an old castle; and is famous for the brandy which bears its name, and is exported to all parts of the world, chiefly to England, the north of Europe, and America. It was under the guidance of some English houses founded here in 1780 that the trade attained its subsequent development.

COGNATES, relations by the mother's side. See Agnates.

COGNOMEN, the hereditary family name (such as Cicero, Cato, &c.) among the ancient Romans. The other two names generally borne by every well-born Roman, viz. the *nomen* and *prœnomen*, served to denote the individual and the *gens* or class to which his family belonged.

COGNOVIT, in law, is a written confession given by the defendant that the action of the plaintiff is just, or that he has no available defence. It is usually made upon condition that he shall be allowed a certain time for the payment of the debt or damages and costs: it is supposed to be given in court, and impliedly authorizes the plaintiff's attorney to do everything necessary in order to obtain judgment.

COHESION is the force by which the various particles of the same material are kept in contact, forming one continuous mass. Its action is seen in a solid mass of matter, the parts of which cohere with a certain force which resists any mechanical action that would tend to separate them. In different bodies it is exerted with different degrees of strength, and it is measured by the force necessary to pull them asunder. According to Sikingen, the relative cohesive strengths of the metals are as follows:—

Gold,	150,955
Silver,	190,771
Platinum,	262,361
Copper,	304,696
Soft iron,	362,927
Hard iron,	559,880

Cohesion in liquids is very much weaker, the parts being disjoined with much more facility; and in substances existing in the gaseous form it is entirely overcome, the particles repelling instead of attracting each other.

Cohesion in bodies is weakened or overcome by two general causes—by the repulsion communicated by heat, or by the attraction which may be exerted by the particles of one body on those of another.

Heat communicated to a solid body always diminishes the force with which the attraction of aggregation or cohesion is exerted; if the heat be increased to a sufficient extent the cohesion is so far weakened that the body passes into the liquid form; and if carried still farther, the attractive force is entirely overcome, repulsion is established between the particles, and the body passes into the gaseous state.

The same effects are produced by the exertion of that attraction which unites the particles of one body with those of another. If a liquid be poured on a solid, it often happens that their mutual attraction is sufficiently powerful to overcome the cohesion of the solid; its particles are consequently disunited, to combine with those of the liquid, and it entirely disappears. This forms the chemical process of *solution*. A similar effect is sometimes produced by the chemical action of a gaseous body.

When these powers, whether of heat or of chemical attraction, are withdrawn, cohesion resumes its force, but with results which are different, according to the circumstances under which this happens. When the attraction of aggregation is suddenly and forcibly exerted the particles are united, in general, indiscriminately, and according to no regular law. If a body which has been melted is suddenly cooled to a sufficient extent it becomes solid, and forms a mass of no regular structure or figure; or if its cohesion has been suspended by the chemical attraction exerted by another body towards it, and if this attraction suddenly cease to operate, the force of cohesion is resumed, and the solid substance appears in the form of a powder. This latter case forms the chemical operation denominated *precipitation*. But if the force of cohesion is exerted more slowly the particles are united, not indiscriminately, but usually with regularity, so as to form masses of regular structure and figure, bounded by plane surfaces and determinate angles. This forms the operation of *crystallization*; and such masses are denominated *crystals* (which see).

COHESION FIGURES. When small drops of various liquids lighter than water, and slightly soluble in it, are allowed to fall on the surface of perfectly pure water, the drops form curious figures on account of the differences between the capillary tensions of the air surfaces of the liquids. (See CAPILLARITY.) These are called cohesion figures. They were investigated by the late Mr. Tomlinson, the results of whose researches are published in various papers in the Philosophical Magazine since October, 1861. Creosote, for example, forms a disc which sails about on the surface with a rapidly quivering motion. Ether, again, forms a circular figure composed of a central boss, surrounded first by a flat depressed ring, and then by a raised ring, the edge of which is waved. Mr. Tomlinson has observed many other liquids. The figures last for a short time, gradually disappearing as the drop becomes dissolved in the water. The slightest impurity in either liquid changes the figure by altering the superficial capillary tension of the liquid. Hence Mr. Tomlinson proposed to observe the figure as a test of the purity of certain essential oils. In applying the test it is necessary to have the water perfectly pure and clean, and Mr. Tomlinson has given special methods of cleansing the glass vessel into which distilled water is put. Mr. Tomlinson has also examined cohesion figures of fluids dropped on other liquids besides water, as cocoa-nut oil, castor-oil, melted paraffin, &c.

COHOBATION, an operation in which a fluid is converted into vapour by heat, and is then condensed, but instead of being collected in a separate receiver, as in distillation, it is made to flow back into the heated vessel. It is employed to produce a change in the fluid by continued heating, but more frequently to subject some substance to the action of a fluid without either loss of the latter or the necessity of adding fresh quantities of it.

COHOES. See SUPPLEMENT.

COHORT. See LEGION.

COIF (French, *coiffe*), the badge of serjeants-at-law, who are called serjeants of the coif, from the lawn coif which they wore under their caps when created serjeants.

COIMBATORE, or COIMBETOOR, a district of Hindustan, in Madras presidency, with an area of 7842 square miles. The country has on the west the range of lofty mountains called the Western Ghauts; a continuation of which also bounds it on the north. On the east it is bounded by Salem and Trichinopoly, and south by Madura and Travancore, west by Malabar and Cochin. It is fertile, producing sugar, cotton, rice, and tobacco; and well watered by several rivers. The climate is very malarious in some parts. The principal towns are Coimbatore, Erroad, and Carroor. In 1799, on the death of Tippoo, and the division of his territories, Coimbatore was ceded to the East India Company. Pop. (1881), 1,657,690; (1891), 2,004,839.

COIMBATORE, a town of Hindustan, and capital of the province to which it gives name, situated at the foot of the Western Ghauts, on the river Noyel • 90 miles S. Seringapatam, 252 S.W. Madras. It has wide streets, is well built and well drained has an agreeable climate, and is more suitable for the residence of Europeans than most Indian towns. It suffered much in the wars between the British and the Mysore sovereigns. Pop. (1891), 46,383.

COIMBRA (anciently *Conimbrica*), a city of Portugal, capital of the province of Beira, situated on a mountain on the right bank of the river Mondego, 115 miles N.N.E. Lisbon; pop. 17,329. It is a bishop's see, and contains an old and a new cathedral, an hospital, and a university. The university was originally founded in 1291, at Lisbon, but was transferred hither in 1308, and is now the only one in Portugal. The course of study here is divided into five branches, viz. theology, law, medicine, mathematics, and philosophy. To the university belong a botanic garden, a library of 80,000 volumes, a museum of natural history, and an observatory well furnished with instruments. The city also possesses a military college, and a college of arts. The aqueduct, on twenty arches, is remarkable. The environs of Coimbra produce oil, wine, lemons, and oranges of excellent quality. The inhabitants manufacture linen, pottery, earthenware, articles of horn, and preserves.

COIN, a town, Spain, Andalusia, province of, and 21 miles W. Malaga, on a gentle declivity facing the north. The houses are tolerably built, and the town possesses numerous spacious and clean streets, and three squares—the principal having a promenade and handsome fountain in its centre. It has a town-hall, an Episcopal palace, and in the environs several public walks and gardens adorned with fruit-trees, flowers, and fountains. Manufactures:—linen and woollen fabrics, esparto mats, soap, paper, hempen shoes, wine, and oil. Trade:—cattle, grain, fruits, &c. In the neighbouring hills quarries of marble are wrought, and jasper of all colours is obtained. Pop. (1887), 9825.

COINING AND COINAGE. Coining is the art of converting pieces of metal into current coins for the purposes of commerce. We shall give here a brief outline of the process as carried on in the Royal Mint, Tower Hill, London. The difference of the processes in coining gold, silver, or copper is so slight that we shall confine ourselves to the coining of gold. Gold is brought to the mint in the form of ingots, each weighing about 180 ozs. Each ingot is tested by the assayer, and according to his report the melter adds either alloy or fine gold to bring it to the *standard fineness* (22 parts pure gold to 2 parts alloy). The metal is cast into bars of about 26 lbs., measuring 21 inches long, 1·375 inch broad, and 1 inch thick. Each bar has to be assayed, and if declared of standard fineness is forwarded to the coining department. Here the bars are submitted to six pinches between pairs of rollers made of chilled cast-iron, driven by steam power; this reduces them to 0·194 inch thick, and increases the breadth to 1·712 inch. The bars are now inclosed in copper tubes and placed in the annealing furnace, where they remain, subjected to a full red heat, for twenty minutes. They again receive six pinches between the rollers, and come out 0·120 inch thick by 1·778 inch wide. The fillets, as the bars are now called, after being repeatedly rolled and gauged, are passed to the tryer, who cuts a trial-blank from each and weighs it; if it vary more than ⅛ of a grain, the fillet is sent back to be remelted. The fillets are taken to the cutting-out room, where blanks the size of the required coin are struck out by steel cylinders moved by an excentric. The *scissel*, that is, the scraps left after the blanks are cut out, weighing about one-third of the original plate, is returned to the melter; the blanks are sent to be weighed by the automaton balance, an instrument which weighs to the 0·01 of a grain with certainty, and at the rate of 23 blanks per minute. A standard sovereign should weigh 123·274 grains; but as the machinery cannot produce two coins in a million of this exact weight, a certain limit or *remedy* (as it is called) is allowed, and the mint is allowed to issue a sovereign 0·2568 grain above or below the standard weight. The blanks that come within this limit, and which are called *mediums*, pass on to be coined; the heavy blanks are reduced by filing to correct weight, but the light ones are returned to the melting-room. Before reaching the press-room, however, the correct blanks have to be passed through the marking machine, by which the edge of each piece is made smooth and a little raised in order that they may be all the more perfectly milled; they are annealed to soften them for the die, and cleaned or blanched by being put for a few minutes into a pot of hot and dilute sulphuric acid to remove any oxide of copper from the surface; they are subsequently washed with water and carefully dried, and are now ready to be *stamped* or coined. The beautiful bloom on new coin is caused by the copper on the surface being removed by the sulphuric acid; the gold, of course, which remains on the surface must be in a spongy condition. The press-room, where the blanks have now arrived, contains a series of presses ranged in line upon a solid bed of masonry and firmly bolted down. The blanks are placed on the lower die of the press, and the upper die is brought forcibly down upon them by levers driven by steam, the coin being kept rigidly in its place, and prevented from spreading laterally by being fixed into a steel collar on which is engraved the *milling*, which is thus transferred to the coin at the same time as it receives the reverse and obverse impressions from the dies. (For the manufacture of dies see DIE-SINKING.) The operation of placing the blanks on the dies, and removing them after they are coined, is effected by the machinery connected with the press, which is attended by boys, who have merely to fill a tube or sort of hopper with the blanks. Each of the presses strikes from sixty to one hundred and twenty coins per minute, one in every two hundred of which turns out to be imperfect.

Before any coin is allowed to leave the mint it is inspected as to its workmanship, and as to being within the limits under or over the standard weight. From each bag of 15 lbs. into which they are placed, a pound in tale is promiscuously taken and carefully weighed by the assay-master, who declares aloud the *minus* or *plus* weight on each pound. From this pound weight of gold two pieces are taken, one of which is handed to the chief assayer to prove that the metal has undergone no deterioration in any of the processes of manufacture; the other piece is sealed up in a packet and consigned to the *pyx-box*, where it remains until the *trial of the pyx* takes places. This is carried out once a year before a jury of goldsmiths, the place where the proceedings are held being the Goldsmiths' Hall. See PYX (TRIAL OF THE).

In ancient times gold and silver circulated in ingots by weight, and the denominations of money were the same as those of weight; but as commerce extended, the inconvenience of weighing gold and silver, and testing their purity, must have been considerable. This led to the introduction of coins of gold, silver, copper, &c., impressed with a stamp as a guarantee of their purity and weight. Silver and brass money was used by the Anglo-Saxons and Danes; the Normans used silver only. Gold money was introduced into England towards the end of the reign of Henry III. Copper coins were first circulated in 1672, and were replaced by the present bronze coinage in 1860. At the Conquest the pound sterling was equal to a Tower pound of silver of the old standard, and it continued of this weight till the 28th of Edward I. The Tower pound, also called Rochelle pound, used in the mint till 18 Henry VIII. was three-fourths of an ounce less than the pound troy. Since that year the pound troy has been used. The pound was divided into 20 shillings, and each shilling into 12 pennies, of the weight of 24 grains each. Nothing, therefore, could have been more simple or convenient in every respect than this system of coinage, which subsisted unaltered for two centuries, and till several years after a second metal had been introduced into the circulation.

Edward I. reduced the weight of the coins by coining a pound of silver into 20*s.* 3*d.* Edward III., by three several reductions, brought the silver pound to 25*s.*; Henry IV., to 30*s.*; Edward IV., to 37*s.* 6*d.*; Henry VIII., to 42*s.* 2¼*d.* in the 18th year of his reign. Passing over the changes which happened between this and the second of Elizabeth, she, by two reductions, brought the Tower pound to 58*s.* 1½*d.*, or the pound troy to 62*s.* Other and more questionable operations for the depreciation of the currency were subsequently in agitation at different periods. James I. had taken measures for a new reduction, when he was induced to give it up, chiefly by the sage counsels of Lord Bacon. The speech of Sir Robert Cotton to the same purpose, in the reign of Charles I., and its salutary effects, are well known. John Locke had the honour of crushing an ill-advised attempt of this nature by his celebrated treatise on the value of money. In 1816, however, it was enacted that the pound troy of silver should be coined into 66*s.*

The changes in the gold coins have been made both by a diminution of their weight and an increase of their denomination, but principally in the latter way, and with the view of adjusting them to the value of the silver currency during its successive changes, both real and nominal. The adjustment was made in the former way in Edward III.'s reign and in that of Henry IV. In the subsequent changes it has been made by the latter method; but when the nominal value of the current gold was raised, it was generally found expedient to issue new gold coins of the former nominal value. Thus, when Edward IV. altered the silver coinage, he raised the gold noble from 6*s.* 8*d.* to 8*s.* 4*d.*; but he soon after coined *angels* at 6*s.* 8*d.*, the old value of the noble, and *angelets*, equal to the former half-nobles; and when Henry VIII. first raised the angel from 6*s.* 8*d.* to 7*s.* 6*d.*, he coined *george-nobles* of 6*s.* 8*d.* When the last reduction of the silver took place in Elizabeth's reign, the rate of gold to silver in coins of the old standard was fixed at $10\frac{59}{60}$ to 1, and in those of the new (or of crown gold) at $10\frac{31}{60}$ to 1. Since that period the changes in the gold coin have only been calculated to keep pace with the gradual alterations in the relative real values of the two precious metals. It is remarkable that no such alteration seems to have called for a readjustment of the coinage till the beginning of James I.'s reign, although America had been discovered above a century, and even the richest of the silver mines, those of Potosi, upwards of fifty years; and under Elizabeth, about the beginning of the seventeenth century, the gold was valued at a lower rate, in proportion to the silver, than under Edward III.; yet the average silver price of wheat, during the last half of the sixteenth century, was nearly five times its silver price during the first half. (See Smith's Wealth of Nations, tables at the end of book i. chap. 11.) We should expect to find the whole gold coin exported, therefore, during this period, in consequence of the mint prices of the two metals being so much nearer each other than their market prices. But although no great exportation of gold seems to have been the result of this discrepancy, soon after James' accession it was found necessary to raise the mint price of gold; and, by three several operations, that prince brought the proportion between gold and silver to $13\frac{2}{3}\frac{2}{3}$ to 1, in coins of the old standard, and $13\frac{1}{3}\frac{1}{4}$ to 1, in those of the new. After the Restoration it was raised still further; and the whole rise, during sixty years from the union of the crowns, was $32\frac{5}{8}$ per cent. But notwithstanding the great depreciation of silver from the middle of the sixteenth to the middle of the seventeenth century, the silver price of gold seems to have risen with a very unaccountable slowness. The first reduction in the weight of the gold coin which James I. made was found sufficient to create an unprecedented abundance of that currency for several years; yet it amounted to no more than 10 per cent. of rise in the mint price of that metal. This was indeed, in some years more, found to be insufficient; and in the ninth year of his reign he augmented the mint price 10 per cent. further, by raising the nominal value. No sooner had this measure been adopted than it was found that the rise was much too great; the silver coin began to disappear, and continued diminishing rapidly for many years, to the great discomfiture of the government, as we find by various proclamations against the manufacture of plate and the exportation of bullion, '*in respect of the excesse of forraigne commodities, which is a thing in itselfe intolerable.*' Yet the price of silver was all this time continuing to fall, and did not, in fact, reach its lowest point before the year 1640 or 1650. It was not till this last period, or about the time of the Commonwealth, that the depreciation of silver was able to counteract the effects of the too great rise in the mint price of gold, effected by the two operations of James, and by another reduction which he very injudiciously made at the time when silver was most quickly disappearing. After this the market silver price of gold continued to rise, so that Charles II. once more reduced the weight of the gold coin; the guinea was issued at 20*s.* value, but it became current at a higher rate, and was allowed to vary with the relative market prices of the two metals. The silver coin, during the remaining part of the century, suffered extremely from clipping; and at last this evil rose to such a height that the guinea passed for 30*s.*; all commodities became dear in proportion; and silver bullion was exported to buy gold. The recoinage was now undertaken at a great expense; and during the interval the people became more accustomed to gold than to silver coins, which were besides disliked in general on account of their late degradation. Guineas were at the same time prohibited from passing for more than 22*s.*; they soon fell to 21*s.* 6*d.*; but this was still higher than the market price of gold bullion, and the new silver coins were accordingly exported; so that in 1717, when government referred the consideration of the matter to Sir Isaac Newton, he was of opinion that in a short time the payments of silver would not be made without a premium. In pursuance of this great man's advice the nominal value of the guinea was reduced to 21*s.*, and it was fixed at this rate as legal tender.

The violent changes which took place in the monetary system during the interval between the 34 Henry VIII. and the 6 Edward VI., were of a different description from those hitherto under consideration. They consisted in alterations of the standard. By three several debasements Henry VIII. reduced the standard of silver from 11 oz. 2 dwts. and 18 grains alloy, to 4 oz. and 8 oz. alloy; and Edward VI. brought it down to 3 oz. and 9 oz. alloy; so that the pound of old standard silver was now coined into £13, 6*s.* $4\frac{3}{4}$*d.* Nor was any regard paid to the relative values of gold and silver during these alterations. The proportion in 36 Henry VIII. was $\frac{8}{11}$ to 1; and in 3 Edward VI. it was $5\frac{5}{11}$ to 1; and in 5 Edward VI. it was only $2\frac{1}{3}$ to 1; so that enormous profits, sometimes above 350 per cent., were made by melting and exporting the gold coin; and accordingly it all disappeared from circulation in a very short time.

For this evil a reform of the coin was the only remedy; and it was undertaken at the end of Edward's reign, upon very judicious principles, and to the fullest extent. He left this salutary change nearly completed; and Elizabeth, by putting the last hand to so great a work, obtained, as often happens in such cases, the glory of the whole enterprise. Indeed, there is nothing really admirable in the general policy of this renowned princess with respect to the coinage. If she finished the reform of her brother, she departed from some of its wisest principles; and, after restoring the standard of fineness, she reduced the weight of the currency, by several operations, and was only prevented from executing still greater changes, by the firmness and sagacity of Burleigh. The issue of base coin in Ireland during Tyrone's rebellion is a measure scarcely to be paralleled in the history of public frauds. If we except the extravagant imitation by James II. it stands unmatched in the annals of the coinage. The inefficacy of the plan was remarkable. The Irish were ready for every species of submission after the defeat of the insurrection; but the base coin was universally rejected, and would not pass, even at its real value. James II., after the Revolution in England, forced a copper and pewter coinage upon the Irish, at the rate of above 660 times its intrinsic value.

The coining of money is one of the prerogatives of the supreme power in all states, and as money is the medium of commerce it is the crown's prerogative and monopoly as arbiter of domestic commerce, to give it authority or make it current. The many complicated English laws on this subject were repealed by statute 2 William IV. cap. xxxiv. By 24 and 25 Victoria it is made a felony to counterfeit coin; to colour or gild, so as to make a resemblance to gold or silver coin; to impair or lighten coin; to have in unlawful possession filings or clippings produced by impairing or lightening coin; to buy or sell, or import or utter counterfeit coin. It is made a misdemeanour by 16 and 17 Victoria cap. cii., to deface coin by stamping or bending it for advertising purposes, and a penalty is imposed for uttering such defaced coin. The statute also makes a tender of such coin invalid. There are various provisions against making, sending, or having in possession any coining tools, and against having in possession counterfeit coin knowing the same to be false, and intending to utter or put off the same.

COIR, the outer coating of the cocoa-nut, often weighing from 1 to 2 lbs.; when stripped off longitudinally it furnishes fibres from which are manufactured matting, bagging, sails, ropes, and cables. The general preparation is simple: after being soaked for some months in water the fibrous coats become soft; they are then beaten to remove the other substances with which they are mixed, which fall away like saw-dust. The fibres thus cleaned are ready for being spun into long yarns, woven into sail-cloth, or twisted into cables. Cordage made of this material rots in fresh water and snaps in frost, but from the fact of its being strengthened by salt water, and its extreme buoyancy as compared with hemp cables, floating as it does in water, and also its great strength and elasticity, it is preferable in many respects to ropes of hemp. It has been proposed to employ it in the construction of deep-sea telegraphs, as being much cheaper and lighter than gutta-percha.

COIRE, or **Chur**, the capital of the Swiss canton of the Grisons, on the rivers Plessur and Rhine, with 9380 inhabitants in 1888. It is irregularly built, and possesses many houses in the ancient style of architecture. The most remarkable buildings are the old Romanesque cathedral, partly dating from the 8th century, and the old Episcopal palace. Adjoining this is an ancient and lofty tower believed to be of Roman origin. Among modern buildings are a Protestant church, government buildings, and a hospital. Not far from Coire the Rhine begins to be navigable for small vessels. Until 1498 Coire was a free imperial city, but at that time came under the government of the bishop, who was under the Archbishop of Mentz. After having been repeatedly in the hands of the Austrians, French, and Swiss, in 1802 it was definitely united to the Swiss Republic.

COJUTEPEQUE, a town of Central America, in the republic of Salvador, and on the highway between the town of San Salvador and San Vincente. There is a lake of same name at some miles' distance, the fish of which are often cast ashore dead in considerable quantities. Pop. 5000.

COKE, the carbonaceous residue of coal which has been heated out of contact with air, until all volatile matter has been expelled. It consists of carbon to the extent of about 90 per cent., and there is besides present inorganic matter forming the ash, the kind and amount of which depend on the quality of the original coal, and also materially affect the value of the coke. There are different kinds of coke, but the following need only be specified: oven coke, gas coke, and a modification of the latter, gas carbon; these are produced in different ways. The simplest method is based on the preparation of wood charcoal. A central flue is erected, round which the lumps of coal are built, air passages being left, and the pile is finally smothered with clay or coal-dust. It is then set on fire, either by hot coals introduced by the central chimney, or by lighting the heap at the circumference, sufficient air being admitted to keep the mass at the proper temperature for decomposition without wasting the coke. After the volatile portions are got rid of, the heap is allowed to cool, or is extinguished with water, and the coke is then ready. Instead of burning the coal in this fashion ovens are commonly employed. The construction of ovens varies in different countries: they are dome-shaped or vaulted, with controlled apertures for admission of air and escape of gases; or closed vessels with receivers for the gases, tar, and ammoniacal water; or buildings so arranged that the waste heat is turned to account in coking another portion of the coal, or in heating a boiler or blast, or in evaporating solutions, or in some other useful way. The coal to be coked is broken down, and to free it as much as possible from pyrites and other impurities it is levigated with water, though this involves considerable waste. It is next put into the oven, kindled, at the bottom or at the top, according to circumstances, and the heat allowed to permeate it until the gaseous and fluid products are driven off. There seem to be some advantages in beginning the combustion at the top: the volatile products are almost completely consumed, after previously depositing part of their carbon by contact with the red-hot coke; the coke is not so liable to be wasted, and by continuous exposure to the heat, perhaps for three to five days, is rendered dense and hard. This is one of the most important points in a coke, and appears to be obtained most completely by the open oven system. When the oven is a close one, the coke is seldom so compact, and is unable to bear the pressure and blast to which the hard coke is exposed in certain manufactures. Still large quantities are so prepared, considerable saving being effected by utilizing the waste heat and also by collecting the tar and ammonia. The number of closed furnaces of different construction is considerable. Some of these are of rather complicated construction. They are more common in Germany than in the United Kingdom; and in the former country the owners of the ovens sometimes agree to receive the coal and convert it into coke free of cost, recouping themselves by the by-products.

Gas-coke is the fixed carbon—mixed with ash—which remains in the retorts after the illuminating gas has been prepared. It differs much in properties from the preceding, though it is essentially the same substance. The difference seems partly due to the mode of preparation and partly to the kind of coal used. The rapid disengagement of a large volume of gaseous and liquid decomposition products, and the subsequent exposure to a high temperature not being so long sustained, render it very soft and porous, so that it cannot well be used in metallurgy. But where a smokeless fire is required without a strong draught at command, and where the fuel has no weight to carry, this variety is preferable as it burns more readily.

The particular variety called gas carbon is produced when gaseous or volatile hydrocarbons are kept for some time at a red heat. This is what occurs in the retorts when the gas is prevented passing away by having too great pressure to overcome. In contact with the red-hot retort the olefiants are decomposed, and a portion of the carbon deposits on the top and sides. This is a loss in every way. The illuminating effect of the gas is diminished, and the carbon deposit in the retort is objectionable as it takes up space, destroys the rapid heating of the retort, and being very refractory is troublesome to remove. This form of coke is dull and earthy, it is extremely hard and difficult to burn. Being a conductor of electricity it has been used in some forms of galvanic battery instead of platinum.

Good coke has a columnar form, an iron-gray colour, sub-metallic lustre, is hard, and somewhat vesicular, but gas-coke has rather a slagged and cindery look, and is more porous. It is used where a strong heat is wanted without smoke and flame, and it is accordingly largely consumed in drying malt and similar purposes. It used to be burned regularly in locomotive-engines, but raw coal is now commonly substituted. The largest quantities however are consumed in iron-smelting, a process in which great attention must be paid to the density of the coke and its freedom from ash. The use of coal for the smelting of iron in Great Britain dates back more than 250 years, to the time when government interfered with the conversion of timber into charcoal for iron smelting. For the time this was a serious blow to the iron makers, but gradually charred pit-coal or coke was substituted for wood charcoal, and the mineral fuel has long ago completely superseded vegetable, at all events for great smelting operations. After coke had been for some time in use in English furnaces, the method of applying it was taken to France by M. Jars, who was engaged on a mineralogical journey through Britain.

COKE, Sir Edward, one of the most eminent English lawyers, the son of Robert Coke, Esquire, of Norfolk, was born in 1551. He received his early education at the free school of Norwich, whence he was removed to Trinity College, Cambridge. From the university he went to London, and entered the Inner Temple. He pleaded his first cause in 1578, and was appointed reader of Lyon's Inn, where his lectures were much frequented. His reputation and practice rapidly increased, and he was placed in a situation of great respectability and affluence by a marriage with a co-heiress of the Paston family. He was chosen recorder of the cities of Norwich and of Coventry; was engaged in all the great causes at Westminster Hall, and in the thirty-fifth year of Elizabeth chosen knight of the shire for his county, and speaker of the House of Commons. In 1592 he became solicitor-general, and soon after, notwithstanding the exertions of the queen's favourite, the Earl of Essex, in the interest of Bacon, Coke's great rival, he was appointed attorney-general. The death of his wife, who brought him ten children, gave him another opportunity of increasing his influence, by a marriage with the widow Lady Hatton, grand-daughter of Lord High-treasurer Burleigh. He acted the usual part of a crown lawyer in all state prosecutions; and one of the most important that fell under his management as attorney-general, was that of Essex (who had fallen into disgrace), which he conducted with great asperity. Soon after the accession of James I. he was knighted. The celebrated trial of Sir Walter Raleigh followed, in which Coke displayed a degree of arrogance to the court, and of rancour and insult towards the prisoner, which was universally condemned at the time, and has been deemed by all posterity one of the greatest stains upon his character. On the discovery of the gunpowder plot he obtained great credit by the clearness and sagacity with which he stated the evidence; and in 1606 he became chief-justice of the common pleas. In 1613 he succeeded to the important office of chief-justice of the Court of King's Bench, but was in much less favour with James than his rival Lord Bacon. He was, in fact, too wary and staunch a lawyer to commit himself on the subject of prerogative; and as his temper was rough, and his attachment to law truly professional, he could scarcely forbear involving himself with a court so notorious for arbitrary principles as was the English during the reign of James. The honourable zeal which he displayed in the execrable affair of Sir Thomas Overbury, and in the prosecution of the king's wretched minions, Somerset and his countess, for that atrocious murder, made him enemies; and advantage was taken of a dispute, in which he erroneously engaged with the Court of Chancery, to remove him, in 1616, both from the council and his post of chief-justice. His real offence, however, was a refusal to favour the new favourite Villiers in some pecuniary matter. Coke meanly made up this breach by marrying his youngest daughter, with a large fortune, to the elder brother of Villiers, and was, in consequence, reinstated in the council in 1617, and actively engaged in prosecutions for corruption in office, and other crimes of a nature to recruit an exhausted treasury by the infliction of exorbitant fines. He, however, supported the privileges of the Commons with great tenacity; for which, after the prorogation of Parliament in 1621, he was committed to the Tower. He was, however, quickly liberated; but was again expelled the privy-council, with peculiar marks of displeasure on the part of James. On the accession of Charles I. he was nominated sheriff of Buckinghamshire, in order to prevent his being chosen member for the county, which, however, he represented in the Parliament which met in 1628. The remainder of his career was highly popular; he greatly distinguished himself by his speeches for redress of grievances; vindicated the right of the Commons to proceed against any individual, however exalted; openly named Buckingham as the cause of the misfortunes of the kingdom; and, finally, sealed his services to the popular part of the constitution, by proposing and framing the famous 'Petition of Rights,' the most explicit declaration of English liberty which had as yet appeared. This was the last of his public acts. The dissolution of Parliament, which soon followed, sent him into retirement, at Stoke Pogis, in Buckinghamshire, where he spent the remainder of his life in tranquillity. He died in Sept. 1634, in the eighty-fifth year of his age, leaving behind him a numerous posterity and a large fortune. Two days before his death the king caused his house to be searched for seditious papers, and all his manuscripts were carried off. Sir Edward Coke was a great lawyer, but a great lawyer only. In mere legal learning he has perhaps never been excelled, but he was essentially defective in the merits of systematic arrangement and regard to general principles, without which law is a mere collection of arbitrary rules, undeserving the name of science. It must be admitted, however, that his writings, and especially his Commentary on Littleton's Treatise on Tenures, form a vast repository of legal erudition. In short, he was a man of immense professional research, and great sagacity and perseverance in a chosen pursuit; and, as usual, more philosophical and general powers were sacrificed to its exclusiveness. His principal works are Reports, from 1600 to 1615; A Book of Entries (folio, 1614); Institutes of the Laws of England, in four parts; the first of which contains the commentary on Littleton's Tenures; the second, a commentary on Magna Charta and other statutes; the third, the criminal laws or pleas of the crown; and the fourth, an account of the jurisdiction of all the courts in the kingdom; A Treatise of Bail and Mainprise (1636, 4to); Reading on the Statute of Fines, 27 Edward I. (4to); Complete Copyholder (1640, 4to).

COLA, a genus of plants belonging to the natural order *Sterculiaceæ*, found in the west of Africa. The *Cola acuminata* produces seeds which are largely used in Africa on account of their digestive, refreshing, and invigorating properties, and have also been introduced into Great Britain and elsewhere on the same grounds. They have been found to contain caffeine, the active principle of coffee, and also the same active principle as cocoa.

COLBERG, or Kolberg, a Prussian seaport and watering-place (formerly fortified) in Pomerania, on the Baltic, at the mouth of the Persante; pop. (1891), 16,999. It was often attacked and besieged by the Russians in the war against Frederick the Great; and in 1807 it was successfully defended by General Gneisenau, Schill, and the citizen Nettelbeck, against the French Generals, Feulié, Loison, and Mortier, who commanded in succession the besieging corps, consisting of 18,000 men. The garrison, which was only 6000 men strong, had over 400 killed and nearly 1100 wounded. Colberg is a very ancient place, having been the see of a bishop in the tenth century.

COLBERT, Jean Baptiste, a celebrated French minister of finances, descended from a Scottish family, was born at Rheims in 1619. He entered in 1648 the service of Le Tellier, secretary of state, by whom he was made known to Cardinal Mazarin, who availed himself of his assistance in the financial administration of the kingdom. Mazarin rewarded him in 1654 with the office of secretary to the queen, and recommended him to the king at his death in 1660. Louis XIV. made Colbert intendant of the finances. Colbert and Le Tellier now joined to effect the fall of Fouquet, for which purpose they had united, the former from ambition, the latter from envy. After effecting this object, Colbert, with the title of a *contrôleur-général*, assumed the direction of the finances. His task was to remedy the evils which the feeble and stormy reign of Louis XIII., the splendid but arbitrary measures of Richelieu, the troubles of the

Fronde, and the confused state of the finances under Mazarin, had occasioned. He found fraud, disorder, and corruption prevailing everywhere. The domains were alienated. Burdens, privileges, and exemptions were multiplied without measure; the state was the prey of the farmers-general, and at the same time maintained only by their aid. The people were obliged to pay 90,000,000 livres of taxes, of which the king received scarcely 35,000,000: the revenues were anticipated for two years, and the treasury empty. He began with establishing a council of finances and a chamber of justice—the first that he might have an oversight of the whole; the other that he might watch the embezzlements of the farmers-general, several of whom were tried and executed: many were imprisoned, and had to disgorge immense sums. For the purpose of alleviating the public burdens he endeavoured to lower the interest of the public debt; and in order to mitigate the odium of this measure he consented to a considerable diminution of the taxes, and to the remission of all arrears up to 1656. He abolished many useless offices, retracted burdensome privileges, diminished salaries, and by a better distribution and collection of the taxes was enabled to reduce them almost one-half. Notwithstanding the expenses of nearly ten years' war, and the prodigality of a luxurious king, Colbert succeeded in twenty-two years in adding to the revenues more than 28,000,000 livres, and making an equal diminution in the public burdens; and at his death in 1683 the revenue actually received amounted to 116,000,000. In 1664 Colbert was superintendent of buildings, of arts and manufactures, and in 1669 minister of the marine. To his talents, activity, and enlarged views the development and rapid progress of industry and commerce in France were largely due. He constructed the Canal of Languedoc; formed the plan of that of Burgundy; declared Marseilles and Dunkirk free ports (the latter town he purchased from the English for 5,000,000 livres); granted premiums on goods exported and imported; regulated the tolls; established insurance offices; made uniform laws for the regulation of commerce, laboured to render the pursuit of it well esteemed, and invited the nobility to engage in it. In 1664 two commercial companies were instituted to trade with the East and West Indies, to which the king advanced considerable sums. The colonies in Canada, Martinique, and particularly in St. Domingo, received new life from their union with the crown, and began to flourish. New colonies were established in Cayenne and Madagascar. For the purpose of maintaining these distant possessions a considerable naval force was required. Colbert created this also. The ports of Brest, Toulon, and Rochefort were repaired; those of Dunkirk and Havre were fortified. Naval schools were established, and order was introduced into all branches of the marine. By the advice of Colbert Louis XIV. caused the civil and criminal legislation to be improved, and the arts and sciences encouraged. Under the protection and in the house of the minister (1663) the Academy of Inscriptions was founded. Three years afterwards he founded the Academy of Sciences, and in 1671 the Academy of Architecture. The Academy of Painting received a new organization. He enlarged the Royal Library and the Garden of Plants, and built an observatory, in which he employed Huyghens and Cassini. He began the measurement of the meridian in France, and sent men of science to Cayenne. After having conferred the greatest benefits on his country he died in 1683, out of favour with the king, and dreading the exhaustion of the treasury by the new war Louis was resolved upon making against Holland.

COLBURN, Zerah, 'the calculating boy,' was born at Cabot, in the state of Vermont, North America, 1st Sept. 1804. Before his sixth year he began to manifest wonderful powers of arithmetical computation. His father resolved to exhibit them in public; and the boy astounded by the rapidity and accuracy of his processes the learned mathematicians of Dartmouth and Harvard. In 1812 he was brought to London, and after travelling over England, Scotland, and Ireland, went to Paris, where he stayed eighteen months. Returning to London in 1816, he was placed by the Earl of Bristol in Westminster School, where he studied for three years. Upon his father refusing to comply with some of the earl's arrangements Zerah was withdrawn from that establishment; and after satisfying himself and his tutor Charles Kemble that he was by no means adapted for the proposed vocation of an actor, he became for a short time a teacher, first as assistant, and then in a school of his own. He lost his father in 1824, and returned to America, where he was employed again in teaching. In 1825 he became connected with the Methodist Church, and after nine years' service as an itinerant preacher he settled in Norwich, Vermont, and was soon afterwards named professor of languages in the university of that town. From the memoir of himself published in 1833 we learn that he lost his faculty of computation before he left England. He died on 2nd March, 1840. When a boy of six or seven years he could answer questions in multiplication of four or five places of figures, proportion, involution, evolution, compound fractions, and the obtaining of factors even of large numbers, with accuracy and a rapidity to which the most experienced mathematician could not attain. Some of the results of this remarkable faculty are the following:—Being asked the factors which produce 247,483, he answered 941 and 263 (its only two factors). Being asked the factors of 36,083, he immediately replied that it had none. The French mathematicians had said that 4,294,967 297 ($=2^{32}+1$) was a prime number having no factors, but in a few seconds Colborn gave 641 × 6,700,417. His simple processes he was able after two or three years to explain, but the more intricate ones he could give no account of until much later in life. On two numbers, say 4791 and 238, being given to be multiplied, he first multiplied 4000 by 200, then 700 and 90 and 1 by the same, adding the results as he proceeded; then he multiplied them by 30 and 8, adding the results. In extracting roots, if the square consisted of five figures, say 92,416, he first sought a number squared which would produce the last two figures = 04; next he sought a number which when squared would give the first figure of the square, or come the nearest under it, which is 3. Putting these together he had 304, the number sought.

COLCHESTER, a mun. and parl. borough and river-port, England, county Essex, 51 miles N.E. by E. London; a station on the Great Eastern Railway. The greater portion of the town is situate on the summit and north and east sides of an eminence rising from the river Colne; it is well-built, paved, and lighted with gas, and amply supplied with water. The town was formerly surrounded by walls, in which were four principal gates, and of these there are several remains. On an elevated spot to the north of the High Street are the remains of an old castle, said to have been founded by Edward the Elder. Besides the parish and district churches, there are places of worship for various Dissenters, and a Royal grammar-school which was founded by Henry VIII. The charities are numerous; amongst them are a hospital founded by James I., and another called the Essex and Colchester hospital. There are literary, philosophical, and other societies, an excellent museum of antiquities, a public library, a technical college, and a theatre. A new town-hall has been erected. There are several extensive tailoring establishments, which with one or two boot and shoe factories, flour-mills, and large engineering works, employ many hands. The coasting-trade is pretty extensive, especially with London and the northern counties of England. The principal exports are corn, malt, and oysters; in the last-named traffic a great number of small craft are employed. The Colne is navigable for vessels of 150 tons to Hythe, a short distance down the river, where are the custom-house, quay, warehouses, and bonding stores. Colchester is a place of high antiquity, there being no town in the kingdom where so great a quantity and variety of Roman remains have been found as here. It is supposed to be the *Camulodunum* of the Romans; was called *Caer Colon* by the Britons, and *Colne Ceaster*, from its situation on the Colne, by the Anglo-Saxons. It suffered severely during the war between Charles I. and his Parliament, having in 1648 sustained a siege of eleven weeks' duration, conducted by Fairfax. It lost one of its two members of Parliament in 1885. Colchester is an important and steadily growing garrison centre. Pop. in 1881, 28,374; in 1891, 34,559; in 1901, 38,351.

COLCHESTER, LORD. See ABBOT (CHARLES).

COLCHICUM. The *Colchicum autumnale*, or meadow saffron, is a bulbous-rooted, stemless, perennial plant, which grows in various parts of Europe, and is extremely common in light pastures in many parts of England. It belongs to the poisonous natural order Melanthaceæ, in whose dangerous qualities it fully participates. From a small corm or bulb, buried about 6 inches deep, and covered with a brittle brown skin, there rises in the early autumn a tuft of flowers having much the appearance of crocuses, flesh-coloured, white, or even variegated. After a short exposure to the sun and air, the flowers wither up, and the plant disappears till the succeeding spring, when some broad leaves are thrown up by each corm along with a triangular oblong seed-vessel. There can be no doubt that cattle are injured by eating either the flowers or leaves of this plant, whose acrid flavour and heavy nauseous odour indicate its dangerous qualities. It may be destroyed with little difficulty by hand-pulling the leaves when they first appear, and continuing to do so as they protrude above the ground. The corm is employed as a remedy for gout, and is believed to be identical with the base of the *eau medicinale*, so long a celebrated empirical remedy for that disease. It is also used in many cases of rheumatic affections, which often resemble the gout.

COLCHIS, the ancient name of a region at the eastern extremity of the Black Sea, resting on the Caucasus, and corresponding partly to Mingrelia. It is famous in Greek mythology as being the destination of the Argonauts. The people were celebrated for frugality and industry, and from their dark complexion, crispy hair, language, and customs, Herodotus is of opinion that they were of Egyptian origin. The country abounded, according to Strabo, in all kinds of fruits and material for ship-building. Linen was an important branch of manufacture, and wool of fine quality and in great quantity was produced.

COLCOTHAR (also called *Crocus martis*, and *rouge d'Angleterre*) is an impure brownish-red oxide of iron, which remains after the distillation of the acid from the sulphate of iron. It forms a durable colour, but is most used in the polishing of glass and metals.

COLD. See CATARRH.

COLD CREAM, a cooling ointment, which may be made by melting 4 ozs. of white wax in 1 lb. almond-oil by means of a gentle heat. Then mix gradually with a pint of rose-water in a warm mortar. We give another recipe. Take two parts spermaceti, two parts white wax, and three parts almond-oil; melt together, and then add rose-water as before. This ointment gratefully cools the skin, rendering it soft and pliable, and is successfully applied for the cure of chapped hands.

COLDSTREAM, a town in Berwickshire, on the northern bank of the Tweed, which is here crossed by a bridge that unites the two kingdoms, and forms a well-frequented thoroughfare. The ford of Coldstream was a favourite point in ancient times with the invading armies of England and Scotland, being the passage by which they made their way alternately into the countries of each other. When General Monk quartered here in 1659–60 he raised a regiment, which still continues to be called *the Coldstream Guards*. This regiment is included in the Household Brigade, and, with the exception of the 1st Foot, is the oldest in the army. The population is 1535.

COLD-WATER CURE. See HYDROPATHY.

COLEBROOKE, HENRY THOMAS, a celebrated oriental scholar, born in London in 1765. He received his education at home, resided from the age of twelve till sixteen in France; and in 1782 was appointed to a writership in India. Shortly after the foundation of the college of Fort-William (Calcutta) he was appointed professor of Sanskrit. Subsequently he was for some time president of the Board of Revenue and a member of the supreme council of Bengal. Many of the most valuable of the papers published by the Asiatic Society of Bengal, of which he was a director, were contributed by him. He died in London, 18th March, 1837. Among the most important of his works we may mention a Digest of the Hindu Laws, translated from the Sanskrit; a Grammar of the Sanskrit Language; contributions to the Asiatic Researches, and to the Transactions of the Royal Asiatic Society of Great Britain. To those in quest of information regarding the philosophy, language, and customs of the Hindus these works are invaluable. See Miscellaneous Essays of H. T. Colebrooke, with Life (three vols. London, 1873–74).

COLENSO. See SUPP.

COLEOPTERA (Greek, *koleos*, a sheath, and *pteron*, a wing), an order of insects the species of which are commonly known by the name of *beetles*. The insects which constitute the order Coleoptera may be characterized as having four wings, of which the two superior are not suited to flight but form a covering and protection to the two inferior, and are of a hard and horny or parchment-like nature, and when closed their inner margins, which are straight, touch, and form a longitudinal suture. The inferior wings, when not in use, are folded transversely under the superior, and are membranous. The appendages of the mouth are well adapted for cutting, and the metamorphosis is complete.

COLERAINE, a town, Ireland, county of Londonderry, on both sides of the river Bann, about 4 miles from its mouth, and 47 miles N.W. of Belfast. It consists of a central square called the Diamond, and several diverging streets, and has long been celebrated for its fine linens. Its trade, chiefly in agricultural produce, and provisions, is considerable; and it has a valuable salmon fishery. There is regular steam communication with Glasgow. It was a parl. borough previous to 1885. Pop. (1881), 6694; (1891), 6845.

COLERIDGE, HARTLEY, eldest son of Samuel Coleridge, was born at Clevedon, near Bristol, on 19th September, 1796, and had his birth commemorated by his father in two sonnets. Upon the elder Coleridge taking up his residence in the Lake district, Hartley and his brother Derwent were placed as day scholars under the charge of a clergyman at Ambleside. Amid the brilliant literary society which composed his father's circle of friends his mind was formed, and while a boy he was noted for his skill in inventing and telling stories. In 1815 he became a student at Merton College, Oxford, and having inherited his father's conversational talents, was soon in great request at the wine parties and other festivities of the undergraduates. An unfortunate propensity was thus formed for drinking, which proved even more ruinous than his father's craving for opium. He took his degree with high honours in 1818, and obtained a fellowship at Oriel College, but forfeited it for intemperance before the close of his probationary year. He then left Oxford and resided for two years in London, contributing occasionally to the London Magazine, in which his first sonnets appeared. His friends induced him against his will to settle at Ambleside for the reception of pupils, but this scheme, as might have been expected, failed. He continued, however, to reside in the Lake country, fixing himself latterly in a cottage on the banks of Rydal Water. During this period he enjoyed the friendship and good offices of Wordsworth, who had taken a paternal interest in him from a child. He likewise employed himself extensively in study and literary composition, contributing to Blackwood's Magazine, and producing a volume of Poems, and the lives of the Worthies of Yorkshire and Lancashire. Many of his sonnets will rank with the finest in the English language, while the charming vivacity of his biographies leave only room for regret that he had not accomplished more as a prose writer. In 1839 he wrote a life of Massinger for an edition of his works published by Mr. Moxon. He died on 6th January, 1849, and was buried in Grasmere churchyard, adjoining the spot where his friend Wordsworth was laid a few months afterwards. A memoir of Hartley Coleridge, with a collection of poems written by him in his later years, was published after his death by his brother Derwent.

COLERIDGE, HENRY NELSON, was the son of Colonel Coleridge, a brother of the elder Coleridge, and born in 1800. He was educated first at Eton and then at King's College, Cambridge, where he distinguished himself by gaining three of the Broune medals, twice for the Greek and once for the Latin ode. In 1823 he became, along with Macaulay, Praed, and others, one of the contributors to Knight's Quarterly Magazine, for which he wrote several able historical articles under the signature of Joseph Haller. Having fallen into ill health he accompanied, in 1825, his uncle, the Bishop of Barbadoes, on a voyage to that island, and on his return published a lively and interesting account of his sojourn, under the title of Six Months in the West Indies. He was called to the bar in 1826, and shortly afterwards married his cousin Sara, only daughter of Samuel Taylor, and sister to Hartley Coleridge. In 1830 he published an Introduction to the Study of the Greek Classic Poets, and after his uncle's death set himself to the task of committing to writing the reminiscences of Coleridge's conversation, which were published under the title of Specimens of the Table-talk of the late Samuel Taylor Coleridge. He also edited the posthumous writings of his uncle, including three volumes of Literary Remains, published in 1836 and 1838, and Confessions of an Inquiring Spirit, in 1840. After a lingering and painful illness, which he bore with great fortitude, he died on 26th January, 1843. —His wife, SARA COLERIDGE, who inherited much of her father's genius, is known in the world of letters by her romance of Phantasmion, and her editions of Aids to Reflection, and other works to which she appended valuable disquisitions. She aided her husband materially in editing her father's works, and continued the accomplishment of this labour after his death. She is also the author of Pretty Lessons for Little Children, which passed through several editions. She died 3d May, 1852.

COLERIDGE, SAMUEL TAYLOR, a celebrated English poet, was born on 21st October, 1772, at Ottery St. Mary, Devonshire, of which his father was vicar. At the age of nine he lost his father, and by the influence of a friend obtained a presentation to Christ's Church Hospital, where he remained till his nineteenth year. One of his schoolfellows was Charles Lamb, with whom a lasting friendship was formed. While a mere boy Coleridge was remarkable for his wonderful conversational powers. He took little interest in the ordinary sports of childhood, and was noted for a dreamy abstracted manner, though he made considerable progress in classical studies, and acquired great celebrity for the admirable art with which he recited the ancient Greek poets. He also bewildered himself at an early period with metaphysical and theological studies, and before he was fifteen is said to have read through the whole of a circulating library, folios, catalogues, and all. In 1791, having attained the position of deputy Grecian or head scholar at Christ's Church, he obtained a presentation from thence to Jesus College, Cambridge. Here he remained for two years, but the only special distinction achieved by him was gaining the prize for a Greek ode. A rationalist at this period in religious and a republican in political matters, his ultra views on these subjects attracted the animadversions of his superiors at college. Owing, it is said, to a disappointment in love, he one day suddenly quitted Cambridge, proceeded to London, and after wandering about the streets for some time and giving his last penny to a beggar, enlisted in the 15th Dragoons under the name of Comberbach. In this new sphere his progress was far from brilliant, as he was a very awkward horseman and slow in acquiring a knowledge of military exercises. He is said to have written his comrades' letters, in return for which they would look after his horse and accoutrements. A correction of a Greek quotation which he ventured one day to address to his officer, revealed his real position, and a communication was in consequence established with his friends by which his discharge was effected. He now took up his residence at Bristol with two congenial spirits, Robert Southey, who had just been obliged to quit Oxford for his Unitarian opinions, and Lovell, a young Quaker. The three conceived the project of emigrating to America, and establishing a pantisocracy as they termed it, or community in which all should be equal, on the banks of the Susquehanna. This scheme, however, never became anything more than a theory. Money was needed to start it, and of this the three enthusiasts were equally scarce. In 1795 the three friends married three sisters, the Misses Fricker of Bristol. Coleridge about this time started a periodical, the Watchman, which advocated extreme opinions in religion and politics, but which did not live beyond the ninth number. In 1796 he took a cottage at Nether Stowey, in Somersetshire, where he was soon after joined by the poet Wordsworth and his sister, who came to reside at Allfoxden, in his neighbourhood. The two young poets used to ramble together over the Quantock Hills, and arranged together the collection of poems, entitled Lyrical Ballads, which appeared in 1798, and contained Coleridge's Ancient Mariner. He had previously, in 1796, published a collection of juvenile poems in co-operation with Charles Lamb. While residing at Nether Stowey he used to officiate in a Unitarian chapel at Taunton, and in 1798 received an invitation to take the charge of a congregation of this denomination at Shrewsbury, where, however, he did nothing further than preach the probation sermon. An acquaintance had been formed by him some time previously with the Wedgewoods, and these friends now bestowed on him an annuity, and furnished him with the means of making a tour to Germany with Wordsworth in 1798–99. He attended the University of Göttingen, and made himself acquainted with the German language and literature. Having returned to England, he got literary employment in London, and his translation of Schiller's Wallenstein was published. In 1800 he took up his residence at Keswick, where Southey joined him in a year or two, while Wordsworth lived at Grasmere in the same neighbourhood. From this circumstance of the three poets inhabiting the same district, the epithet of the 'Lake school' was affixed to them by the Edinburgh and other reviewers. Some time previously Coleridge had contracted the pernicious habit of opium-eating, which clung to him nearly to the end of his life, and seriously impaired his mental and physical powers. About 1804 his health had considerably declined, and with the view of re-establishing it he proceeded to Malta, where he acted for a time as secretary to Sir Alexander Ball, the governor. In 1806 he returned to England. In 1808 he delivered a course of lectures on poetry and the fine arts, at the Royal Institution. A periodical entitled the Friend was started by him at Penrith in 1809, but only reached the twenty-seventh number. His religious and political views had now undergone a great change from those professed by him in younger days, his rationalistic notions being abandoned for orthodox tenets, and his ultra-radicalism for conservative principles. In 1810 he quitted permanently the Lake district, and resided with various friends in London or elsewhere till 1816, when he located himself for the remainder of his life in the house of his friend Mr. Gillman, a surgeon at Highgate. Every attention and kindness were here shown him, and for a time he manifested a good deal of literary activity, publishing his Biographia Literaria, his Essay on Church and State, and his Aids to Reflection. A conversazione used to be held weekly by him in Mr. Gillman's house, when for hours consecutively he would pour forth those unintermitting torrents of wondrous eloquence which enchained all listeners. Some idea may be formed of the variety and extent of his conversational powers from the two volumes of his Table-talk, published after his death. In 1825 he was chosen one of the ten royal associates on the incorporation of the Royal Society of Literature, and as such received an annuity of 100 guineas out of the king's private purse till the death of George IV. He died on 25th July, 1834.

In person Coleridge is described by Wordsworth as 'a noticeable man, with large gray eyes'. With an ardent and affectionate nature his amiable qualities endeared him to the hearts of a large circle of friends, while at the same time his vacillating and irresolute character rendered him in a manner through life the creature of circumstances, and reduced many of his greatest efforts to the condition of magnificent fragments. His poetry eminently exhibits the peculiar characteristics of his mind, dreamy and transcendental, with at times glimpses of the mysterious and unseen, which break upon us like voices from another world. Such are his Ancient Mariner, Christabel, and Kubla Khan. In sublimity of thought and expression even Milton has nothing superior to his Hymn at Sunrise in the Vale of Chamouni, while his Genevieve is an impersonation of tenderness and purity of sentiment. Some passages of his rendering of Schiller's Wallenstein excel, in all the elements of poetic merit, those in the original. His metaphysical prose writings are little else than adaptations from the German philosophers, whole pages being frequently merely translated from Schelling. As a critic of literature and the fine arts, Coleridge may be said to have schooled the minds of his younger contemporaries. His Literary Remains, as well as Specimens of his Table-talk, were edited by his nephew, Henry N. Coleridge. There are various editions of his poetical and dramatic works. Among biographical accounts of Coleridge, that of Mr. Traill in the English Men of Letters series deserves mention; and more especially that by J. Dykes Campbell (1894), whose edition of the poems is also excellent. Coleridge's son Hartley and his daughter Sara are separately noticed. (See above.) Another son, Derwent (1800–83), entered the church, and was principal of St. Mark's College, Chelsea, from 1841 to 1864, and subsequently rector of Hanwell. He wrote poems, pamphlets, and a work on the Scriptural Character of the English Church (1839). His son Ernest Hartley has published Letters of S. T. Coleridge (2 vols., 1895) and Anima Poetæ, selections from the poet's unpublished note-books.

COLET, John, an eminent divine, and founder of St. Paul's School, London, was born, probably in London, towards the end of 1466. He was the eldest of twenty-two children, and his father, Sir Henry Colet, was twice lord mayor of London. When about seventeen years of age he became a student of Magdalen College, Oxford, where he became a good Latin scholar and mathematician. Several benefices were conferred on him before his ordination, among them being the rectory of St. Mary Dennington, Suffolk, which he held till his death. About 1493 he set out to make a continental tour, and became acquainted with several of the most eminent men of the time, and more especially with Erasmus. While on the Continent he studied Greek, canon and civil law, and the writings of the fathers. In 1496 he returned to England, and in the following year he was ordained deacon, becoming priest a few months later. He took up his residence in Oxford and lectured in Latin on St. Paul's Epistle to the Romans. He showed an unmistakable critical spirit in discussing the Bible, and he also ventured to advocate ecclesiastical reform. Erasmus was one of his audience at a later series of lectures on the First Epistle to the Corinthians, and from this time (1498) the two scholars became warm personal friends. In 1505 Colet was appointed dean of St. Paul's, and is said to have aroused a spirit of religious inquiry by his discourses, thus becoming one of the pioneers of the Reformation. His conduct was not allowed to escape without animadversion; and his friend Latimer declares, in one of his sermons, that he would have been burned as a heretic if God had not turned the king's heart to the contrary. St. Paul's School was founded and endowed in the years following 1509. Colet ventured to denounce the war policy of Henry VIII., but nevertheless the king made him a royal chaplain. He died on Sept. 16th, 1519, and was buried in St. Paul's Cathedral. His writings are not numerous, but give good evidence of his learning and piety. In 1867–76, J. H. Lupton produced an edition of those of Colet's works which had not been published during the sixteenth and seventeenth centuries. The most recent biography is that by Lupton (1887).

COLEWORT. See Cabbage.

COLIBRI. See Humming-bird.

COLIC, in pathology, a painful affection of the intestines, especially of the large bowel or colon, whence the name. The pain is due to spasmodic and irregular contractions of the colon, and is felt chiefly in the region of the navel. It is of a severe twisting character, and comes on in paroxysms, occasionally so severe that the patient rolls and twists about, usually doubled up and grasping his belly, and not seldom groaning or crying. Constipation of the bowels usually accompanies colic, and the pain may give rise to vomiting. Often, however, severe colicky pains are the forerunner of looseness of the bowels, caused by some food which has disagreed. The pain may be caused by wind, the discharge of which affords great relief. There is no fever with the attack, but the pulse is usually lowered, and the face pale and anxious-looking. In this respect colic differs from inflammatory attacks of the bowels. Pressure on the belly generally gives relief in cases of colic, but in cases of inflammation the patient cannot endure pressure. Whether the attack be one of colic or not may readily be learned from the attitude of the sufferer and the fact of his exerting or avoiding pressure. Treatment consists in applying hot cloths or bags of hot salt across the belly. Doses of medicine, such as castor-oil, should also be administered, and a large injection of water at a gentle warmth will probably bring relief. In the case of an adult patient thirty drops of laudanum may be given along with the castor-oil, or shortly after it. Magnesia and dill-water are also used as remedies for colic in young children. Lead-colic or painters' colic is described in the article on LEAD-POISONING. What is called biliary or renal colic is caused by the passage of gall-stones towards the bowels. It occurs oftener in women than in men.

COLIGNY, GASPARD DE, admiral of France, born in 1517, at Châtillon-sur-Loing, distinguished himself under Francis I. in the battle of Cerisoles, and under Henry II., who made him colonel-general of the French infantry, and in 1552 admiral of France. He was distinguished for valour in battle, for strict discipline, and for his conquests over the Spaniards, in particular for his defence of St. Quentin. When St. Quentin was taken by storm, the admiral was made prisoner. After the death of Henry II. the intrigues of Catharine de' Medici induced him to place himself at the head of the Calvinists against the Guises. He formed so powerful a party that the Catholic religion in France seemed to be in danger. Condé was more ambitious, enterprising, active; Coligny more considerate, prudent, and more fit to be the leader of a party; equally unfortunate in war with Condé, but skilled in remedying even what appeared irretrievable losses, and more to be feared after a defeat than his enemies after a victory, he was besides endowed with virtues, which he practised as far as party spirit and the violence of the times permitted him. The first battle between the Huguenots and Catholics (1562, at Dreux) was lost by the admiral, but he saved his army. When the Duke of Guise was murdered at the siege of Orleans, he was accused of being the author of the murder, but he cleared himself by an oath: it was unnecessary, the nobleness of his spirit raising him above suspicion. The civil war recommenced with increased fury in 1567. Coligny and Condé encountered the Constable Montmorency at St. Denis. This indecisive action was followed by the battle of Jarnac (in 1569), which was fatal to the Calvinists. Condé fell, and the whole burden of command devolved on Coligny. He alone sustained his party, and was beaten again at Moncontour, without, however, losing his courage. An advantageous peace seemingly put a stop to this contest (1570). Coligny appeared at court, and was, with his adherents, loaded with favours. Charles IX. gave him 100,000 francs as an indemnification for his injuries, together with a seat in the council. From all sides he was warned not to trust to these caresses. As the admiral was leaving the Louvre, August 22, 1572, his right hand and left arm were wounded by a shot from a window. One Maurenal had fired at him from a building belonging to the monastery of St. Germain l'Auxerrois, according to the plan of Catharine de' Medici, probably with the knowledge of the Duke of Guise. Charles testified the deepest sorrow, caused search to be made for the assassin, and said to Coligny, 'My father, you have the wounds, but I the pain.' This he said at the moment when the massacre of the Protestants was already prepared. The slaughter began on the night of St. Bartholomew's, August 24, 1572. (See BARTHOLOMEW'S DAY, ST.) The Duke of Guise hastened with a numerous suite to the house of the admiral. One Behme, or Besme, at their head, entered with his drawn sword into the chamber of the old man, who, sitting in an easy chair, said with a calm mien to their leader, 'Young man, my gray hairs ought to command thy respect; but do as thou pleasest; thou canst shorten my life but a few days;' upon which the wretch pierced him with several stabs and threw the body out of the window into the courtyard. The corpse was given up for three days to the fury of the people, and finally was hung up by the feet on a gibbet, at Montfaucon. Montmorency, a cousin of Coligny, caused it to be taken down, and had it secretly buried in the chapel of the castle of Chantilly. An Italian carried the head to Catharine, who ordered it to be embalmed and sent to Rome.

COLIMA, a town and port of Mexico, in the state of same name. The town, which is the state capital, is situate in a fertile plain, near the volcano of Colima, which rises to a height of 12,003 feet. It has a considerable demand for various articles of trade, such as linens, cotton goods, woollens, and hardware. Pop. 23,572. The port, called Puerto de Colima or Manzanillo, is about 30 miles S.S.W. from the city. It is accessible to large vessels, and is connected by railway with the capital.

COLISEUM, more properly COLOSSEUM, a gigantic ruin in Rome, the greatest amphitheatre which Roman magnificence ever erected. It was commenced by Vespasian (reigned 69–79 A.D.), and practically finished by Titus about the year 80 A.D., who dedicated it with shows in which 5000 animals were killed. It is said to have held 100,000 spectators, of whom about 87,000 were seated. For the greater part it consists of travertine, is elliptical in shape, 1680 feet in circumference, and 157 feet high, and has three rows of columns, one above the other: the lowest is of the Doric, the second the Ionic, and the highest the Corinthian order. The diameter of the arena from side to side was 182 feet, from end to end 285 feet. Down to the sixth century this monument of ancient grandeur remained almost uninjured, when Theodoric, king of the Goths, caused material to be taken from it for the construction of various buildings; afterwards Pope Paul II. took all the stones from it which were used for the construction of the palace of St. Mark, and in later times some other palaces were erected from its fragments. At present, care is taken not to touch the ruins of the Coliseum, but it is gradually crumbling away of itself. Only a portion (from six to ten arcades) of the upper range remains, the lower part is comparatively entire. The Coliseum received its name from the colossal statue of Nero which was placed in it. The traveller, after having viewed this immense building by daylight, should return to gaze again by the light of the moon, when its grandeur is really amazing.

COLL, a small island on the west coast of Scotland, off Mull, county Argyle, one of the Hebrides, about 12 miles long, and from 3 to 3½ miles broad, with about 60 miles of bold, rocky coast. It has two bays of some size at the south-west extremity, respectively called Loch Breacacha, which runs about a mile into the land, and affords tolerable anchorage in summer, and Crossapol Bay; but the only harbour worthy of notice is at Arinangour or Arinagour, where Loch Eatharna runs inland, about the middle of the east coast. There are several small lakes and streams. On the N.W. side are three mineral springs. The surface is uneven, but the highest summits do not exceed 339 feet. A vein of lead ore is known to exist, but it has never been wrought. A considerable portion of Coll is composed of moor. There are, however, many spots of remarkable fertility, and some tracts of light and sandy soil, which are tolerably productive, and there is good pasturage. The cattle reared are of superior quality, and agriculture is carried on in the most approved fashion. The remains of several Danish forts are still visible. Pop. in 1881, 643; in 1891, 522.

COLLATERAL RELATIONS, those who descend from the same stock, but belong to different lines of descent. See DESCENT.

COLLE, a town of Italy, prov. Siena, on the Elsa, 22 miles S.S.W. from Florence. It is divided into an upper and a lower town, has a fine cathedral, and important glass-works. Pop. 4379.

COLLECT, a term applied to certain short prayers found in the liturgies of all churches. Some of the collects of the English Church are taken from the old Roman Missal, and are supposed to have been written by St. Jerome. Others are still more ancient; while a few have been added after the Reformation. There is a collect for every Sunday in the year, and a corresponding epistle and gospel. According to Blunt 'the characteristic features of the Collect form of prayer are: (1) an invocation; (2) a reason on which the petition is to be founded; (3) the PETITION itself, centrally placed, and always in few words; (4) the benefit hoped for; (5) a memorial of Christ's mediation, or an ascription of praise, or both'.

COLLECTIVISM, that socialistic theory or system the special feature of which is the doctrine that all the means of production in a state or community should belong to the state or community collectively and as a whole, and that each worker or producer should receive the full value of what he produces, values under this system being estimated not according to a money standard—for there need be no money—but according to the amount of time required to produce commodities. Under present economic arrangements the workman does not receive the full value of his work, too great a share going to the capitalist, and thus serving to aggrandize him and keep him in the position of being able to exploit the workman. In the collectivist state the government would take the place of the capitalist; and after deductions necessary to provide a stock for future production and to support the public service, the individual producer would be at liberty to dispose of what remained to him at his pleasure. How to attain the ideal of the collectivist is a question to which various answers would be given. Many believers in collectivism would repudiate violence, and would invoke instead the orderly action of the legislature inspired by public opinion. See SOCIALISM.

COLLEGE (Latin, *collegium*), in its primary sense, a body of colleagues, a corporation or society of persons invested with certain powers and rights, performing certain duties, or engaged in some common employment or pursuit. Among the Romans, three were required to make a *collegium* or college (as the old maxim ran *tres faciunt collegium*). There were several at Rome, for example, *collegium pontificum*, *augurum*, *septemvirorum*, &c. In Great Britain and America some societies of physicians are called colleges. So, also, there are colleges of surgeons, a college of heralds, &c. Colleges of these kinds are usually incorporated or established by the supreme power of the state. The most familiar application of the term college in English is to a society of persons engaged in the pursuits of literature or science, including both professors or other teachers and students. The early history of these institutions is somewhat obscure; the probability is that they were originally founded in the various universities of the middle ages, with similar objects, and from the same charitable motives. At first the students of the universities had no common bond of union, except that of study and discipline, and were lodged where they could find it convenient. Then hostels or boarding-houses were provided (principally by the religious orders, for the benefit of those of their own fraternity), in which the scholars lived under a certain superintendence. Charitable persons subsequently endowed these hostels that poor scholars might have free lodgings. The foundation of a college was completed when to these endowments were added stipends for all or a certain number of the students residing in these hostels or inns. The colleges of the universities of Oxford and Cambridge are academical institutions of this kind, each endowed with revenues of its own, and having fellows, students, and tutors, who live together under a head, in particular buildings. Each college is regulated by laws framed by its founder, with such modifications as have been deemed necessary to introduce from time to time. According to these laws, the *head* (variously styled master, principal, warden, rector, &c.) is either chosen by the fellows from their own number, or appointed by the crown or other authority. The *fellows* are graduates who receive special emoluments for a term of years, and are generally elected to the position on account of special scholarship; while the *scholars* (admitted as undergraduates) are either chosen from particular localities, schools, &c., or elected according to merit after free competition. There are also a number of ordinary students, all as a rule occupying chambers belonging to the college. The undergraduates receive their instruction chiefly from *tutors*, who are generally resident fellows. The colleges are subordinate to the university, and it is the university that confers degrees, and institutes and carries out the necessary examinations. Generally speaking, the term college implies an institution inferior to a university, so far at least as the right of conferring degrees is concerned; but in Scotland, Germany, and elsewhere there are no colleges such as those of Oxford and Cambridge, and the college or colleges in Scotland are simply edifices in which the teaching is carried on. Some modern colleges are called University Colleges, either because equipped similarly to a university, or because connected with a university, and able to train students for degrees to be obtained from that university. Institutions for teaching theology are often called colleges, and some schools that train pupils for the universities, or give a good secondary education, are also so called.

In France there are university colleges or *facultés* in all large towns, besides *lycées*, corresponding to what are called, in Germany, *gymnasia*. Other institutions of a similar kind, that is schools for secondary education, are called *colléges communaux*. These are public establishments aided by the communes, and subject to the direction of the public authorities. (See FRANCE.) Besides these, there is the *Collége de France*, which deserves the name of a university. It was instituted in 1529 by Francis I., and here numerous professors, among whom there are always some of the most distinguished men, lecture publicly and gratuitously.

In America there are colleges similar to those of Oxford or Cambridge, others that are really universities, and a great many that are little more than high-class schools, if they can even be called that.

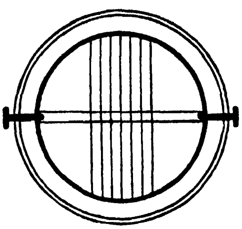
COLLEGE OF CIVILIANS, commonly called *Doctor's Commons*, founded by Dr. Harvey, dean of the Arches, for the professors of the civil law residing in the city of London. The college was composed of a president (the dean of the Court of Arches for the time being), and of those Doctors of Laws who, having taken that degree at Oxford or Cambridge, and having been admitted 'advocates' in pursuance of the rescript of the Archbishop of Canterbury, were elected fellows of the college. 'Proctors' were also connected with the college. The practical functions of this corporation were latterly considerably diminished, and the college ultimately (in 1857) sold its property and ceased to exist.

COLLEGE OF JUSTICE, another name for the Court of Session in Scotland.

COLLEGIATE CHURCH, in England a church built and endowed for a body corporate, as a dean and canons or prebendaries, independently of any cathedral. Elsewhere a church served jointly by more than one minister.

COLLIER, Jeremy, born at Stow Qui, in Cambridgeshire, on Sept. 23, 1650, was educated at the free school of Ipswich, where his father was master, and in 1669 was admitted a poor scholar of Caius College, Cambridge. He took his degree of M.A. in 1676, entered into priest's orders in 1677, and obtained the rectory of Ampton in Suffolk in 1679. Having resigned his rectory, he was appointed lecturer at Gray's Inn, London, in 1685. The Revolution of 1688 found in him a most zealous opponent, and he not only refused to take the oaths to the government of William and Mary, but came boldly forward in defence of his nonjuring principles, and subjected himself to repeated imprisonment, both for writings and other overt acts, which a more tyrannical government might easily have construed into treason. His political writings have almost been forgotten; but he wrote two other works, which have preserved his name, and prove him to have been a writer of distinguished ability. The one, entitled Essays upon several Moral Subjects (1697), is distinguished by learning and wit, and an easy flowing style; the other, entitled Short View of the Immorality and Profaneness of the English Stage (1698), is unquestionably a master-piece, and is still perhaps the best work which has been written on the subject. It enjoyed great popularity, notwithstanding the fierce opposition it encountered, especially from Congreve and Vanbrugh, and is said to have had the effect of greatly purifying both the sentiments and the language of the theatre. The only other work of Collier deserving of special notice is his Ecclesiastical History of Great Britain to the end of the Reign of Charles II., 2 vols. folio (1708 and 1714), best modern edition by T. Lathbury, 1852, 9 vols. It cost him many years of labour, and displays much ability, but is strongly tinctured with his nonjuring views. In the latter part of his life he was afflicted with the stone, and died of it in London on April 26, 1726.

COLLIMATION, Line of. In a measuring telescope there is placed at the focus of the eye-piece a system of spider-threads. In a transit instrument there are seven vertical and two horizontal 'wires', as shown in the diagram. In taking an observation the time at which the star passes behind each wire is noted. Taking the mean of these times we obtain what is called the time for the *mean wire*, an imaginary wire which would, if the adjustments were perfect, coincide with the middle vertical wire. The mean of these observations gives a better result than if only one central wire were used. The line of collimation is defined to be the straight line that joins the centre of the object-glass with the point of this imaginary vertical wire midway between the two horizontal wires. A definition similar to that here given applies in other cases, in the case of the mural circle, for example, and in the case of instruments for terrestrial surveying. The proper adjustment of the line of collimation of these instruments is the most important of all the adjustments. In the case of the transit instrument, for instance, in observing the passage of a star, what is noted is practically the instant, according to the observatory clock, when the line joining the eye and the star coincides with the line of collimation.



As is explained under Transit Instrument, the following is one of the conditions to be satisfied when the instrument is in perfect adjustment. The line of collimation must be perpendicular to the geometrical axis on which the telescope revolves, and will then describe a great circle. The framework that carries the spider-lines admits of several small movements for their adjustment. After the adjustment has been carefully made, however, there always remains a slight error, which is determined and allowed for in calculations under the name of the *collimation error*. Adjustments and corrections are similarly made in the other telescopes for measuring.

COLLIMATORS, two small subsidiary telescopes used for collimating astronomical instruments, that is, for adjusting the line of collimation, and for determining the collimation error. See Collimation.

COLLINGWOOD, Cuthbert, Admiral Lord, a distinguished naval commander, was the son of a merchant, and was born at Newcastle-upon-Tyne, 26th Sept., 1750. He entered the royal navy in 1761. As flag-captain on board the *Barfleur*, he took part in Lord Howe's victory of June 1, 1794; gradually rose in the service, and became a close friend of Nelson. In 1797 he commanded the *Excellent* during the battle of Cape St. Vincent, on the 14th of February. In 1799 he was made rear-admiral of the white, and in 1801 was promoted to the red. In 1804, being then vice-admiral of the blue, he assisted in the blockade of Brest harbour. Next year he received command of a squadron to reinforce Nelson, and his most distinguished service was the part he bore in the great victory of Trafalgar, in which his gallant manner of bringing his ship (the *Royal Sovereign*) into action, and the skill and resolution with which he fought her, excited the personal admiration of Nelson himself, upon whose lamented fall the command of the fleet devolved upon Collingwood as the senior officer. For his valuable services on this and other occasions he was promoted to be vice-admiral of the red, continued in his command of the fleet, and elevated to the peerage with the title of Baron Collingwood, receiving a life pension of £2000. Subsequently his duties kept him mostly watching the French in the Mediterranean, and his death took place off Minorca, in the *Ville de Paris*, on the 7th of March, 1810. His remains were carried to England, and deposited in St. Paul's near those of his friend Nelson. Collingwood appears to have been a model of a naval officer. He was distinguished for zeal, courage, humanity, circumspection, and strictness of discipline, though averse to flogging. His letters to his children are full of excellent sentiments and judicious advice. Every young naval officer should be familiar with the Public and Private Correspondence of the Vice-admiral Collingwood, with Memoirs of his Life (8vo, third edition, London, 1828).

COLLINS, Anthony, born at Heston, near Hounslow, in Middlesex, in 1676, was educated first at Eton, and then at Cambridge. With the view of studying law he entered the Temple, London, but soon abandoned all thoughts of that profession, and devoted himself to general literature. During the years 1703-4 a correspondence was carried on between him and Locke, who regarded him as having 'as much of the love of truth for truth's sake as he had ever met with in anybody.' Among his numerous writings, which were all published anonymously, the one most commonly associated with his name is entitled a Discourse on Freethinking. It attracted considerable notice at the time, and was answered, among others, by Dr. Bentley, under the assumed name of *Phileleutherus Lipsiensis*, the reply being remarkable as a display of deep and learned sagacity, coarse wit, and intemperate abuse. Another work, entitled Philosophical Inquiry concerning Liberty and Necessity, was answered by Dr. Samuel Clarke. In the latter part of his life he suffered much from an excruciating disease, and died of it in 1729. It is admitted on all hands that the moral and social character of Collins was excellent. The duties of the public appointments which were conferred upon him he discharged with integrity and ability, and his benevolent and tolerant spirit gained the respect of many who widely differed from him on theological questions.

COLLINS, William, a distinguished English poet, was born in 1720 or 1721, at Chichester, where his father was a hatter. He was educated at Winchester school and at Oxford. While at college he wrote his Oriental Eclogues, which were printed in 1742. Their success was moderate, and in 1744 the author went to London as a literary adventurer. In 1746 he gave his Odes, Descriptive and Allegorical, to the public; but the sale did not pay for the printing, and the indignant and sensitive poet burned all the unsold copies. Yet among these odes were many pieces which at present rank with the finest lyrics in the language. Pecuniary distress followed this disappointment; and aided by the advance of a few guineas from the booksellers for an intended translation of the Poetics of Aristotle he was enabled to escape into the country, whence he found means to pay a visit to his uncle, Colonel Martin, then with the British army in Germany. The death of this relation, who bequeathed him a legacy of £2000, raised him to comparative affluence; and he immediately returned the booksellers their advance, being reduced by nervous debility to an utter incapability of any species of mental exertion. Originally too laxly strung, disappointment, distress, and irregularity had completely disarranged his nervous system. Although he did not suffer from absolute alienation of mind, it was thought best to confine him in a lunatic asylum; but finally he was consigned to the care of a sister, in whose arms he terminated his brief and melancholy career in 1756. His odes are now almost universally regarded as among the best productions of the kind in the English language for vigour of conception, boldness and variety of personification, and genuine warmth of feeling.

COLLINS, William, an English painter, noted for his landscapes and domestic scenes, was the son of a picture-dealer in London, and born there on 18th September, 1787. In 1807 he entered as a student at the Royal Academy, and early contributed several pictures to the exhibition, gaining the silver medal in 1809 for a drawing from the life. His picture of the Young Fifer, exhibited in 1811, was purchased by the Marquis of Stafford for eighty guineas, and in 1813 he at once raised himself to a position of eminence by his Sale of the Pet Lamb, so well known by engravings. The previous year he had lost his father, who had died in circumstances of great pecuniary embarrassment, and from this and other causes Collins was obliged for many years to maintain a hard struggle with the world. He continued, however, to grow in favour with the public, and sustain the reputation which he had already earned, and in 1820 was elected a Royal Academician. For his picture of the Fisherman's Departure, painted in 1826, and presenting a beautiful specimen of his skill in the delineation of coast scenes, he received the sum of 350 guineas. Other noted works of his are Rustic Hospitality, Sunday Morning, and Happy as a King. In 1836 he visited Italy with his family, and remained abroad for nearly two years. Two admirable sacred pictures, Our Saviour with the Doctors in the Temple, and The Two Disciples at Emmaus, were exhibited respectively in 1840 and 1841. About 1844 decided symptoms of heart-disease began to show themselves, but though frequently suffering extremely from this malady he continued to work at his profession with unabated industry, one of his last pictures being Early Morning, exhibited in 1846. He died on 17th February, 1847. A life of him has been published by his son, Mr. W. Wilkie Collins, the well-known author of the Woman in White, and other popular fictions.

COLLINS, William Wilkie, novelist, the son of William Collins, R.A., the well-known painter, was born in London, 1824; died 1889. He was educated in a private school, and spent several years on the Continent, where he learned French and Italian. Returning to England he was articled to a firm of tea-dealers, but afterwards entered Lincoln's Inn as a law student, a career which he soon exchanged for the more congenial ways of literature. His first effort was a biography of his father, published in 1848, and two years later he essayed light literature in Antonina, or the Fall of Rome. This, his first novel, achieved only a very moderate success, but nevertheless he persevered. Besides a volume entitled Rambles Beyond Railways, he published several novels, with which he secured public attention. Ultimately he became associated with the success of Household Words and All the Year Round. To the former he contributed After Dark, and The Dead Secret; while in the latter were published The Queen of Hearts, The Woman in White, and No Name. Following these in quick succession came Armadale, The Moonstone, Man and Wife, Poor Miss Finch, The New Magdalen, The Black Robe, &c., and at his death he left the unfinished novel of Blind Love. He was also the author of a play called the Lighthouse, and several of his stories were more or less successfully dramatized. As a novelist Wilkie Collins may be said to have been deficient in the power to give a sense of reality to his creations; but in the skill to evolve and sustain a wide web of intricate plot he was altogether unrivalled.

COLLISION, in navigation, is the shock of two ships coming into violent contact, whereby one or both may suffer more or less injury. The leading doctrines of the English law on this subject are thus stated by Lord Stowell:—In the *first* place, collision may happen without blame being imputable to either party, as where the loss is occasioned by a storm or any other *vis major*, in which case the misfortune must be borne by the party on whom it happens to light. *Secondly*, a misfortune of this kind may arise where both parties are to blame—where there has been a want of due diligence or skill on both sides; in such case the loss must be apportioned between them, as having been occasioned by the fault of both of them. *Thirdly*, it may happen by the misconduct of the suffering party only, and then the rule is that the sufferer must bear his own burden. *Lastly*, it may have been the fault of the ship which ran the other down; and in that case the injured party would be entitled to an entire compensation from the other. In a court of common law the same rule holds in the first, third, and fourth cases; but in the second (where both parties are to blame) the rule is, that if the negligence of both substantially contributed to the mishap, neither has an action against the other; but if one of them, by exercising ordinary care, might have avoided the consequence of the other's negligence, the former is liable for any injury sustained by the latter. In pursuance of the Merchant Shipping Amendment Act (1862), orders were issued in 1863, 1879, 1884, and 1885, giving regulations for preventing collisions. These contain rules concerning lights and fog-signals, and sailing and steering rules. With respect to lights it is enacted that steamers shall, when under weigh, carry a white mast-head light, on the starboard side a green, and on the port a red light; when towing other vessels they must carry two mast-head lights, placed vertically. Sailing vessels shall carry only the side lights; fishing and other open boats are not required to carry side lights, but may use a lantern with a red slide on the one side and a green slide on the other, and such lantern must be exhibited in sufficient time to prevent collision, and so that the green light shall not be seen on the port side nor the red light on the starboard side. Ships at anchor in a roadstead must exhibit a white light where it can best be seen, but not 20 feet above the hull, in a globular lantern 8 inches in diameter, showing at a distance of a mile all round. The sailing and steering rules demand that if two sailing ships are approaching each other end on, or nearly so, the helms of both must be put to port, so that each may pass on the port side of the other; in crossing so as to involve risk of collision the sailing ship with the wind on the port side shall keep out of the way of the ship with the wind on the starboard, but if they have both the wind on the same side the ship which is to windward shall keep out of the way of the one that has it to leeward. If a steam-ship and a sailing ship are approaching so as to involve collision, the former must keep out of the way of the latter. The rules for two steam-ships passing or crossing are nearly the same as for sailing ships. If one vessel is overtaking another she must keep out of the way of the last-named vessel. When, according to the rules, one of the ships keeps out of the other's way, that other shall generally be understood to keep her course. The American rules are the same.

COLLODION. See Photography.

COLLOID. See Dialysis.

COLLOT D'HERBOIS, Jean Marie, born at Paris in 1750, after receiving a good education became an actor, and in this capacity travelled through France, Belgium, and Holland, performing in the different towns with considerable success. It was during this period that, according to a custom common amongst actors, he adopted the name of D'Herbois. He afterwards became manager of the theatre at Ghent, but on the breaking out of the French revolution hurried to Paris, where he zealously espoused the views of the ultra-party, and published his Almanach du Père Gérard, which gained the prize offered by the Jacobin Club, and gave him much influence with the most violent revolutionists. After the events of the 10th of August he became a member of the municipal council of Paris, and a few days after the horrors of September was chosen deputy to the national assembly. He afterwards became an active leader of the Mountain against the Girondists. After filling several missions he was sent by Robespierre along with Fouché to Lyons, in 1793, with almost unlimited powers, and was guilty of the most flagrant enormities. Declaring that he found the guillotine too tedious and formal, he introduced the method of executing wholesale by the sword and by discharges of musketry. On his return from Paris he became a determined opponent of Robespierre, and being chosen president of the Convention, (19th July, 1794), contributed powerfully to his fall. A few weeks after his own downfall followed. On the motion of Merlin he was expelled from the assembly and banished, with his worthy associate Billaud-Varennes, to Cayenne. Having here attempted to excite an insurrection of the blacks against the whites, he was imprisoned in the fortress of Sinnamari, and drank himself to death in 1796.

COLLUSION (Latin, *collusio*, a playing together), in law, is a secret agreement between opposing litigants to obtain a particular judicial decision on a preconcerted statement of facts, whether true or false, to the injury of a third party. Collusion, when proved to exist, nullifies the judgment obtained through it.

COLMAN, George, a dramatist of the eighteenth century, born at Florence in 1733, his father being at that time British envoy to the grand-duke's court. From Westminster School he was removed at the usual age to Christ Church, Oxford, where he graduated as M.A. in 1758, having previously, in conjunction with his friend Bonnel Thornton, published a series of essays after the manner of the Spectator, under the title of the Connoisseur. He wrote in 1760–61 the comedies of Polly Honeycombe and the Jealous Wife. The Clandestine Marriage we owe to him and Garrick. This was left unfinished, and it has never been ascertained to which of the authors most credit is due for one of the best pieces in our theatrical repertory. The English Merchant, the Oxonian in Town, and other pieces, followed the foregoing. In 1777 he purchased of Foote for an annuity the little theatre in the Haymarket, and continued in the personal superintendence of it till the year 1790, when a paralytic attack not only deprived him of the use of one side, but destroyed his intellect, leaving him hopelessly insane. He, nevertheless, lingered on in a lunatic asylum at Paddington till 1794, in which year he died.

COLMAN, George ('the Younger'), son of the preceding, was born in London, October 21, 1762. He received his education in a private academy of Marylebone, in Westminster School, at Christ Church, Oxford, and King's College, Aberdeen. On his return to London, being designed for the law, he was entered as a student in the Temple, but soon left legal studies for dramatic and general literature. He assisted his father as director of the Haymarket Theatre, and succeeded him as its patentee. After selling his interest in the theatre he was appointed exon of the Yeoman Guard by George IV.; and by the Lord Chamberlain (Duke of Montrose) examiner of plays, the duties of which he performed with a severe purism, hardly to have been expected in a man who wrote with almost licentious freedom himself. Most of his dramas were well received, and some of them still keep the stage; as John Bull, the Heir-at-law, Poor Gentleman, and Love Laughs at Locksmiths. He died in London, 26th Oct. 1836.

COLMAR, or Kolmar (ancient, *Columbaria*), a city of Germany, in Upper Alsace, formerly in the French department of Haut Rhin, 39 miles s.s.w. Strasburg, on the railway thence to Basel, at the confluence of the Lauch and a branch of the Fecht.

which join the Ill 2 miles below the town. It is agreeably situated about 2 miles from the foot of the Vosges Mountains. Its fortifications were destroyed in 1673, and it is now surrounded by boulevards, and entered by three gates. The only public square of importance is that in front of the cathedral, where a weekly market is held. The public buildings are not remarkable; they consist of the cathedral, built in 1363; the palace of justice, hotel de ville; college, containing the public library with 36,000 volumes, and some pictures by Schön, Albert Durer, &c.; and the museum, where, among other curiosities, a remarkable aërolite is preserved, which fell near Ensisheim in 1492, and originally weighed about 284 lbs. The portion here weighs about 142 lbs. Colmar has manufactures of printed goods, calicoes, silks, &c., besides cotton-spinning mills, tanneries, and chamois-leather works. It has a considerable trade in the manufactured goods of Alsace, and in iron, grain, wine, madder, &c.; and in colonial produce, with which it supplies Switzerland. In 1552 Colmar was surrounded by walls and towers, and made an imperial free town. In 1632 it was taken by the Swedes, who kept it two years. It was united to France in 1697 by the Peace of Ryswick, and surrendered to Germany by the Treaty of Versailles, 26th Feb. 1871. Pop. (1890), 30,411.

COLNE, a municipal borough of England, in the county of, and 31 miles S.E. of the town of Lancaster. It consists of one principal street running east and west, with several subordinate ones diverging. There are two churches and various other places of worship, a town-hall (1894), literary institute, &c. The most remarkable edifice is the Piece Hall, in the Elizabethan style, originally erected for the display of woollen goods. The chief manufactures are cotton goods. Colne was one of the earliest seats of the woollen and cotton manufacture in England, but woollens are no longer made here. Abp. Tillotson was educated at the grammar-school of Colne. Pop. in 1891, 16,774; in 1901, 23,000.

COLOCYNTH. The fruit of *Cucumis* (now *Citrullus*) *Colocynthus*, a species of cucumber, the pulp of which is the colocynth of the shops. It is used in medicine as an aperient. The essential principle, which is of an extremely bitter nature, is known by the name of *colocynthine*.

COLOGNE (German, *Köln*), a strongly fortified city of Prussia, in the Rhine province, on the left bank of the Rhine. It stands upon the river in the form of a crescent, and is connected with Deutz, on the opposite side and forming part of it, by a bridge of boats and an iron bridge. Till recently it was surrounded by fortifications dating from the middle ages, but these have been cleared away, their site built upon, and a wider circuit of works constructed. Until the middle of the nineteenth century a great part of the city bore the impress of the middle ages, the streets being dark, narrow, and filthy; but now the municipality has paid great attention to the amenity and sanitary condition of the town generally by opening up thoroughfares, widening and paving the streets, &c. Among the principal buildings are the town-house, a remarkably fine Gothic building, partly of the fourteenth century; the Gürzenich (1441–52), a splendid Gothic building, used for public festivities, and also accommodating the exchange; the Tempelhaus, a fine Romanesque building of the twelfth or thirteenth century, occupied as the Chamber of Commerce; the government buildings, court-house, post-office, Imperial Bank, railway station. But the object of greatest interest in the town is the cathedral, begun in 1248, one of the finest and purest Gothic monuments in Europe. It is in the form of a cross; its entire length is 490 feet; its breadth, 231 feet; the roof rests on 100 columns, of which the four centre ones are 30 feet in circumference. The choir was long the only part finished; it is 161 feet high, and, with its pillars, arches, chapels, and its superb painted glass windows, presents one of the finest sights conceivable. In 1842 the completion of this magnificent edifice was commenced, after designs by Zwirner; the works were vigorously prosecuted from that time onward, and were completed in 1880. The two western towers are each 511 feet high, and are amongst the highest edifices in the world. The other remarkable churches are those of St. Peter, in which is an altar-piece of the crucifixion of that saint, by Rubens, who presented it to this church, in which he was baptized; St. Mary, on the capitol, occupying the site of the capitol of the ancient Roman city, and dating from about the year 1000, with some good stained glass windows; the Apostles' church, in the Neumarkt, built about the year 1200, a perfect specimen of the Romanesque style, having a singularly elegant and picturesque exterior; the church of St. Ursula, filled with the bones of the 11,000 British virgins, who, according to the legend, were destroyed here on their return to Britain, under the guidance of St. Ursula; the church of the Jesuits, or Maria Himmelsfahrt, dating from 1636, overloaded with gorgeous decorations of marble sculpture, &c.; and St. Gereon's, which, like the church of St. Ursula, is lined with bones, not, however, of virgins, but of the Theban legion of martyrs, slain, according to tradition, during the reign of Diocletian; this is one of the finest and oldest churches in the city. The city contains several gymnasia and other high-class institutions; a technical school; an observatory, and botanical garden; a normal school, a public library, a theatre, several hospitals, a school of design, a museum, &c. The manufactures are very extensive and varied, embracing sugar, chocolate, tobacco and cigars, glue, liqueurs, mineral waters, starch, vinegar, soap, candles, velvet, silk, woollen and cotton goods, india-rubber and gutta-percha wares, machinery and metal goods, &c., and the celebrated *eau de Cologne*, of which there are a great many different manufacturers. Its commerce is considerable; it has a good port on the Rhine, and an extensive railway communication with the interior of Germany and with Belgium and Holland. It is the principal entrepôt of the corn, wine, and oil trade on the river, and has active commercial relations with the Netherlands, Germany, Belgium, and Switzerland.

Cologne is of ancient origin, and was originally called *Oppidum Ubiorum*, being the chief town of the Ubii, a German nation. The Romans made it a colony A.D. 51, and called it *Colonia Agrippina*. It was annexed to the German Empire in 870, and became one of the most powerful and wealthy cities of the Hanseatic league, its population then amounting to 150,000. As early as the eleventh century Cologne carried on an extensive trade with foreign countries, including England, in the produce of the country—wine, corn, flour, malt, beer, &c. The arts and sciences also flourished, and its university was one of the most famous in Germany. Intestine divisions, and other causes, finally effected its ruin, and in 1792 it ceased to be a free city. It was taken by the French in 1794, ceded to them by the Treaty of Luneville in 1801, and restored to Prussia in 1814. Duns Scotus died in Cologne in 1308, and was interred in the chapel of the Minorites; and Rubens was born here in 1577, in the same house in which Mary of Medicis died, in 1642. Pop. (1900), 372,229.

COLOMBIA, REPUBLIC OF (*La República de Colombia*), a republican state of South America, consisting of the nine departments of Antioquia, Bolivar, Boyacá, Cauca, Cundinamarca, Magdalena, Panamá, Santander, and Tolima. This state was formerly known as the United States of New Granada, being established as such in 1861 by the confederation of nine states. In 1863 a new constitution was adopted, and the country now was called the United States of Colombia. Still more recently a fresh constitution was adopted (1886), by which the states lost their separate sovereignty, and now became departments, with a governor instead of a president at the head of each. The constitution vests the executive authority in a president elected for six years, and the legislative in a congress of two houses, a senate and house of representatives. The senate is elected for six years, and consists of three representatives of each of the nine departments. The house of representatives is composed of deputies chosen by electors who must be able to read and write, or must possess an annual income of 500 *pesos* (say £100), or landed property of the value of 1500 *pesos*. There are seven ministers, namely, for war, instruction, the interior, commerce, finance, foreign affairs, and public works. The capital is Bogotá. The annual revenue in recent years has usually been about £2,600,000. There is a foreign debt of more than £3,000,000. The finances are in an unhealthy condition.

The republic of Colombia forms a country of vast extent, though much less so than the first Republic of Colombia, which comprised the whole of New Granada, as well as Venezuela and Ecuador. The territory of the present republic includes the whole of the isthmus of Panamá, bordering on the state of Costa Rica, and of the Pacific coast of South America to the River Mira, which forms the boundary between it and Eucador. Following the course of the Mira and of the river San Miguel, the boundary trends south-east from the coast to lon. 74°, where it takes an east and north-east direction, bordering on the territories of Ecuador and Brazil to about lon. 69° 15′, when it proceeds due north along the Venezuelan territory from about 1° 26′ to nearly 6° N. lat.; from this point it takes an irregular curve, bounded by the State and Gulf of Venezuela, to the Caribbean Sea, which forms its north boundary. Along the south and east boundaries there is a large extent of disputed territory. The area of the republic is estimated officially at 504,773 square miles, but independent authorities consider this estimate to be much too large.

According to the conformation of its surface the country may be divided into two principal regions, namely, the elevated region of the Cordilleras in the west, and that of the low-lying lands in the east. The former occupies the greater portion of the country, and presents a richly-diversified surface, being formed chiefly of three mountain-chains, which start from a point not very far north of the town of Pasto, and stretch northwards in a nearly parallel direction, inclosing between them the valleys of the rivers Cauca and Magdalena. The central chain, or Cordillera of Quindiu and Suma Paz, contains the culminating point of the country, namely, the volcano of Tolima, which rises to the height of 18,270 feet. In the north the Cordillera of the isthmus and the Sierra Nevada de Santa Marta form isolated mountain groups of smaller extent. The two great rivers of Colombia are the Magdalena and the Cauca, both of which flow northwards, and entirely within the country. The former receives the waters of the latter about 120 miles from its mouth in the Caribbean Sea. The low lands of the east belong to the central plains of South America, and form a transitionary region between the plains of North Brazil and the llanos of the Orinoco region. The waters of this part of the country are chiefly conveyed by the Upper Rio Meta and the Guaviare into the Orinoco, or by the Upper Yapurá or Caquetá to the Amazon. The low lands of the Pacific and Caribbean coasts are of but small extent. There are volcanoes still in activity, or which have been so since the discovery of the country. Earthquakes are not uncommon, but are usually less destructive than in Central America. The climate is naturally as varied as the surface of the country. At Honda, nearly 1000 feet above sea-level, so intense is the heat that the hand cannot be held on a stone exposed to the sun's rays, and even the waters of the Magdalena are warm. At Mompox, near the head of the delta of the Magdalena, the sea-breeze ceases, and the remainder of the voyage up to Honda, 350 miles, is made under the most oppressive atmosphere conceivable through myriads of mosquitoes and other stinging insects. The yellow fever is endemic at Cartagena and on the west coasts. On the elevated country, as the plain of Bogotá, 8000 feet above the sea, the climate is perfectly salubrious, and the temperature seems that of eternal spring. The *tierra fria*, as it is called, occupies a large portion of the elevated regions. The *tierra templada*, a still greater extent of country lower down, but by far the greater portion of the surface, including all the coast-lands, the lower valleys of the Cauca and Magdalena and the eastern plains, belongs to the *tierra caliente*. The flora is rich and luxuriant. The limit of trees reaches on Tolima to over 10,000 feet; that of barley is about 1000 feet lower. A great part of the country is still covered with virgin forests, which yield excellent building-wood, Peruvian bark, caoutchouc, vanilla, &c. The fauna is very rich, and includes among other animals the jaguar, puma, tapir, armadillo, sloth, various species of deer, the gigantic condor, and countless other varieties of the feathered tribes. The mineral wealth of the country is various and abundant, though still imperfectly explored. Fine coal occurs in the plain of Bogotá, 8000 feet above the sea. Platinum, gold, silver, emeralds, and diamonds are found, and the annual production of the precious metals exceeds £800,000. But industry of every kind is at a very low stage in Colombia. Maize, bananas, and plantains are the chief articles of food. Rice is little cultivated, and wheat still less, and not enough of the latter is produced to supply the home consumption. Tobacco and coffee are cultivated and exported, especially coffee. Sugar is also grown. Manufactures can scarcely be said to exist—Panamá hats, mats, and coarse cotton cloths being almost the only articles that can be mentioned in this class.

According to official returns the pop. of the nine departments of Colombia is—Antioquia, 470,000; Bolivar, 342,400; Boyacá, 702,000; Cauca, 621,000; Cundinamarca, 569,000; Magdalena, 167,000; Panamá, 285,000; Santander, 555,600; Tolima, 306,000. Total(including220,000uncivilized Indians)4,000,000. The principal towns are Bogotá, 100,000; Medellin, 40,000; Panamá, 25,000. The federal army consists of about 7000 men; in time of war it is 1 for every 100 of the population.

The foreign trade of Colombia is carried on chiefly through the ports of Panamá and Aspinwall. The transit trade across the isthmus is estimated at £15,000,000 per annum. The total annual value of the exports is usually under £3,000,000, that of the imports being similar. In 1898 the exports from Colombia to Britain amounted to £635,488, and the imports of British produce to £789,692. The most important export is coffee, with tobacco, hides, cacao, vegetable ivory, and the precious metals.

New Granada was discovered by Alonso de Ojeda in 1499; it was visited by Columbus on his fourth voyage, in 1502. The first Spanish settlement was made in 1510 at Santa Maria la Antigua in the Gulf of Darien. According to the Spanish custom extensive grants of the country before it was conquered were made to the discoverers and to the leaders of the early settlers. Pedro Arias de Avila, who received such a grant in 1514, had the north coast of Panamá explored as far as Cape Blanco, and in 1518 founded the town of Panamá. The conquest of the interior of the country was effected about 1536–37 by Sebastian de Benalcazar, one of the officers who accompanied Pizarro to Peru, who subdued the southern provinces, and Gonzalo Himenes de Quesada, who reduced the northern districts, and who in 1538 founded the city of Santa Fé de Bogotá, the future capital of the country. The whole country was formed into a single province under a captain-general in 1547. In 1718 New Granada was erected into a viceroyalty. The captain-generalship was restored in 1724, and the viceroyalty again in 1740. On the decline of the Spanish power in Europe the dependence of her American colonies became weakened, and her rule was also felt to be oppressive; hence the invasion of Spain by Napoleon became the signal for most of them to throw off the yoke. New Granada declared its independence in 1811. This declaration entailed a war which continued with varying success till 1822. The Independents were totally defeated in 1816, and the country remained under the Royalists for three years, when it was emancipated by Bolivar, and united in 1819 with Venezuela to form the first republic of Colombia. The first work of the new confederation was to complete the liberation of New Granada, and afterwards that of Ecuador, which was freed from the Spaniards in 1822, and joined the new republic.

When the pressure of resistance to the Spanish yoke was withdrawn the bond of union between the three states was found to be very weak. Venezuela, under General Paez, one of Bolivar's officers, showed in particular a disposition towards independence, and after various internal divisions the three states finally separated into three republics in Nov. 1831. In 1858 the Republic of New Granada took the name of the Granadian Confederation, and included eight states, that of Tolima being subsequently formed, and the town of Bogotá created an independent federal district. In 1861 a democratic revolution conducted by General de Mosquera converted Colombia into the United States of New Granada. The constitution left each of the states to administer its own laws, the central government having to watch over the whole and to prevent aggressions of one state upon another. It also took charge of foreign affairs, and reserved certain taxes for the use of the federal administration. After the revolution there was for a considerable period hardly a year unattended by revolutions, insurrections, or political disturbances in one or more of the separate states. General Mosquera acted as dictator from September, 1861, until the proclamation of the constitution, and as provisional president until 1st April, 1864, the beginning of the term of office of the first president elected under it. On 15th Aug. 1863, after some negotiations with a view to unite Venezuela, New Granada, and Ecuador into one state, he addressed a proclamation to the inhabitants of Ecuador, and approached the frontier with an army. On Sept. 29 the foreign minister of Colombia transmitted to an Ecuadorian plenipotentiary a treaty of peace and confederation to be afterwards submitted to Venezuela. On Oct. 19, Ecuador refusing to sign the treaty, Mosquera published a hostile declaration, and on Nov. 20 Ecuador declared war. On Dec. 12 a battle took place near the frontier at the Indian village of Cuaspud, in which the troops of Ecuador were completely defeated. Before the battle Mosquera observed that they had 6000 men, but he had 4000 soldiers. On Dec. 30 peace was concluded, Mosquera renouncing the accomplishment of his project by force of arms. Mosquera was succeeded as president by Don Manuel Morillo Toro (1864–66). He was elected second president of the republic (for 1866–68). There being disturbances in several of the states he took advantage of a clause of the constitution to proclaim himself dictator, 15th March, 1867, and meeting with opposition in congress he dissolved it on 29th April. On 23rd May he was arrested during the night by the second vice-president, who assumed power, temporarily convoking the congress, and recalling the first vice-president, General Gutierrez, from Europe. General Gutierrez on his return assumed the presidency with the sanction of congress, and was elected president for the next term (1868–70). In 1869 a treaty was concluded between Colombia and the United States giving the latter the exclusive right to construct a canal across the isthmus; but nothing beyond exploring and surveying was done. The canalisation of the isthmus was afterwards undertaken by the Inter-oceanic Canal Company, founded at Paris in 1876. (See PANAMÁ.) A violent revolution broke out in 1884, and after its termination a new constitution was promulgated in 1886. Another revolution complicated by a quarrel with Venezuela took place in 1900–01.

COLOMBO, the capital of Ceylon, a seaport on the south-west coast, near the mouth of the Kelani River, and about 70 miles west by south of Kandy, the principal emporium of the island. It is a handsome town, and has been described as 'a city of high buildings, towers, cupolas, red-tiled roofs, open spaces, flowering trees, green lawns'. A portion of it, comprising most of the best houses, is within the walls of its very extensive fort, which occupies a projecting point of land, and embraces a circumference of nearly 1¼ mile. On the east side of the fort is the Pettah or Black Town, inhabited by Singhalese, Tamils, Hindus, Malays, &c. Several of the streets are lined with rows of trees. The houses of the Europeans outside the town are very beautifully situated, especially those near the sea. There are a great number of well-stocked shops in the town, and several bazaars or market-places. The public buildings comprise the government offices, government house, hall of the supreme court, the valuable museum, &c. Some of these are very handsome structures. An old Dutch church is of considerable interest for its tombs and monuments of Dutch governors. The other buildings comprise hotels, orphan asylum, military hospital and barracks, the town-hall, the railway-station, the Colombo Royal College, St. Thomas's College, Wesley College, &c. There are places of worship for Episcopalians, Presbyterians, Roman Catholics, and others. The Moors have two handsome mosques with minarets; the Hindus also have their temples, rudely sculptured. Water is brought from a distance of 30 miles to the town, and there are extensive gas-works. The Kelani is here crossed by a bridge of boats and by a railway bridge; and tramway lines have been laid. The city contains many gardens, and throughout it there are groves of fine trees. Railways connect it with Kandy and other towns on the island. The ramparts of the fort are very strong, having eight principal bastions, and a number of lesser ones, with curtains, banquettes, and parapets communicating with one another all round. The defensive works have recently been strengthened and new ordnance supplied. South-east of the fort is a lake, into which projects a tongue of land called Slave Island (from its former use under the Dutch), covered with bungalows, and other buildings interspersed among stately areca and bread-fruit trees and cocoa-nut palms. The harbour was formerly capable of receiving small vessels only, and large ships had to cast anchor upwards of a mile from the shore, exposed to the south-west monsoon; but a breakwater now gives complete shelter, and Colombo is the regular calling station for the large steamers bound for Bombay, Madras, Calcutta, the Straits, China, Australia, &c. It is the chief port of Ceylon, its exports and imports including the great bulk of the goods sent from and brought to the island. Pop. in 1901, 154,556.

COLON. See Aspinwall.

COLONEL, the commander of a regiment, whether of horse, foot, or artillery. Any rank above a colonel constitutes the bearer of it a general officer. In the British service the rank of colonel is honorary, and is usually bestowed upon officers of superior rank and princes of the blood, who receive the emoluments of it in addition to those of their regular rank. The actual commander of the regiment is the lieutenant-colonel. In some of the continental armies also the colonelcy is an honorary post held by persons of rank in the army or the state.

COLONNA, one of the most illustrious families of Italy. It is of ancient date, and had become important as early as the eighth century. It derives its name from a legend. Another account of its origin refers it to the town of Colonna in the Papal States, about 14 miles from Rome. Among its possessions was the town of Palestrina. Its riches and the number of its clients gave it the first rank among the Roman nobility. During the middle ages it played an important part in the affairs of Europe, became allied to the greatest houses of Italy, Spain, and Germany, and has furnished many celebrated warriors, popes, and cardinals. Among its most remarkable members are—Giovanni, appointed cardinal in 1216, accompanied the fifth crusade as legate, and founded the hospital of Lateran.—Giovanni, cardinal, nephew of the preceding, a Dominican, died about 1285. He composed numerous historical works, which have remained in manuscript.—Aegidius de, scholastic theologian, prior-general of the Augustine order, born 1247; died 1316. He was an ardent realist and disciple of St. Thomas Aquinas, under whom he studied at Paris.—Giacomo, cardinal, and his nephew Sciarra, general. The former opposed the election of Pope Boniface VIII., and the latter supported Philippe le Bel against the pope, who destroyed their town of Palestrina, and rased their palaces.—Stefano, brother of Sciarra, deserted the policy of his house, and became a supporter of the Guelf party. He was chosen a senator along with Orsini, the hereditary enemy of his family. He was a leader of the nobles in opposition to Rienzi, to whose government he temporarily submitted, but was killed in an attempt to take the city from him by a *coup-de-main* in 1347.—Ottone, Pope Martin V., born 1368, elected by Council of Constance to succeed John XXIII., 11th Nov. 1417, died at Rome, 20th Feb. 1431 (see Popes).—Fabrizio, general, cousin of Prospero and father of Vittoria, served in the army of Charles VIII. of France in 1494; in the army of Frederick, king of Naples, in 1497; and afterwards in that of Ferdinand the Catholic, by whom he was made grand-constable in 1507. Subsequently he served in the Papal army under Julius II. In 1512 he was made prisoner at the battle of Ravenna by Alfonso d'Este, duke of Ferrara, who treated him with distinction, and dismissed him without ransom. To show his gratitude he tried to reconcile Alfonso with the pope, and gave him a safe conduct to come to Rome; but Julius kept him prisoner, and attacked his states. Colonna, indignant at this breach of faith, rescued Alfonso from the Papal troops, and reconducted him to Ferrara. He died in 1520. See two following biographies.

COLONNA, Prospero, a celebrated Italian general of the sixteenth century. On the invasion of Italy by Charles VIII. he took part with that prince, owing to his enmity against the Orsini family. He shortly afterwards, however, abandoned the French cause, and bore arms in the Spanish interest. His master in the art of war was the great Gonsalvo de Cordova, and under his leadership it fell to his lot to conduct the famous Cæsar Borgia as a prisoner to Spain. Among his more noted victories were those gained at Vicenza over the Venetians, 1513; and at Bicoque over the French, 1522. He also took Milan from the French in 1521, and Genoa in 1522. In 1523 he defended Milan successfully against Admiral Bonnivet. He was cut off by sickness in the middle of his career in 1523.

COLONNA, Vittoria, the most renowned poetess of Italy, was the daughter of Fabrizio Colonna, high-constable of Naples, and born in 1490 at Marino, a fief belonging to the family. At the age of four years she was destined to be the wife of Ferdinand Francesco d'Avalos, marquis of Pescara, a boy of the same age. The rare excellences both of body and mind with which nature and a most careful education had adorned her, made her an object of universal admiration, so that even princes sued for her hand. But faithful to her vow, she gave her hand at the age of seventeen to the companion of her youth, who soon became one of the most distinguished men of his age. They lived in the happiest union. When her husband fell in the battle of Pavia (1525), Vittoria sought consolation in solitude and in poetry. All her poems were devoted to the memory of her husband. She lived seven years, by turns at Naples and at Ischia, and afterwards retired into a monastery, first at Orvieto, and finally at Viterbo. She afterwards abandoned the monastic life, and made Rome her abode, where she died in 1547. Her most celebrated work is the Rime Spirituali, 1538. They are considered among the happiest imitations of Petrarca.

COLONNA, Cape (ancient *Sunium*), the southern extremity of Attica, Greece. It is of a remarkable appearance, and forms a conspicuous object at sea. Its summit is crowned by the ruins of a temple 269 feet above the sea, said to have been dedicated to Athena, and of which sixteen columns of white marble are still standing. There are caverns beneath the cape, formerly the frequent resort of pirates.

COLONNADE, in architecture, any series or range of columns placed at certain intervals, called intercolumniations, from each other, varying according to the rules of art and the order employed. When surrounding the building on the exterior the colonnade is called a *peristyle;* when projecting beyond the line of the building it is called a *portico.*

COLONSAY and ORONSAY, two islands off the west coast of Argyle, Scotland, united at low-water, and at high-water only about 100 yards apart; united length about 12 miles; breadth varying from 1 to 3 miles. Colonsay is much the larger, and has a diversified surface with fine rock and other scenery and beautiful sandy beaches. On Oronsay are the imposing ruins of an extensive priory, and near it a fine sculptured cross. Cattle and sheep are reared, and fishing is carried on. Visitors land at Scalasaig pier, on the island of Colonsay. The islands are named after St. Columba and St. Oran. Pop. in 1891, 358.

COLONY, a settlement formed in one country by the inhabitants of another. Colonies may either be formed in dependence on the mother country or in independence. In the latter case the name of colony is retained only in a historical sense. The motives which lead to the formation of colonies, and the manner of their formation, are various. The lust of territory; the requirements of commerce; the desire of increasing wealth, combined with the love of adventure; the necessity of relieving the pressure of redundant population; political dissensions; the convenience of removing to a distance persons likely to disturb the peace of the state, and especially the apparent ease with which a numerous criminal class may be got rid of by expatriations, are among the chief motives which have influenced colonization. Colonization is only a more formal development of the migratory tendency; and a colony may be considered as an organized and permanent migration. Among ancient nations the principal promoters of colonization in the more formal sense were the Phœnicians, the Greeks, and the Romans, and the greatest colonizers in modern times have been the English and the Spaniards, next to whom may be reckoned the Portuguese, the Dutch, and the French. The Phœnician colonies, extending along the shores and throughout the islands of the Mediterranean, were mainly commercial. The most famous of them was Carthage, itself a great colonizing state. From the distance of the mother states, and the slowness of communication, many of them must have been practically independent from a very early period; but this was not the case with the colonies of Carthage, which wielded powerful armies and maintained great fleets, both for commerce and for conquest. The Greek colonies were widely spread, being numerous in Asia Minor, the Balkan peninsula, and the islands and coasts of the Mediterranean, in South Italy and Sicily. They were commonly independent, and frequently soon surpassed the mother states in power and importance. Constantinople, Naples, Palermo, and Marseilles were all originally Greek colonies. The Greek civilization was largely based upon and highly favourable to individual liberty, and the independence of spirit which it fostered made political dissension a frequent cause of colonization. A still more pressing one was the limited extent of the Greek territories, and the inviting character of those by which they were surrounded. Rome was a state which left nothing to the individual. Its colonies were chiefly military, and while the empire lasted were all in strict subordination. As the Roman power declined the remains of them amalgamated with the peoples among whom they were placed, and contributed largely to the homogeneous growth of modern civilization.

Before America and the way by sea to the East Indies were discovered, the states of Europe in the middle ages, with the exception of the Genoese and the Venetians, had no foreign colonies. The intercourse and wars of the Portuguese with the Moors, then more advanced in civilization than most of the European nations, served to incite their rivalry and stimulate them to maritime enterprise, and they became the pioneers of Europe in maritime discovery. One of the chief names in this connection is that of Henry the Navigator, son of John I. of Portugal. The Portuguese in 1419 discovered Madeira; in 1431–60 the Azores; in 1487 Bartolomeo Diaz doubled the Cape of Good Hope; and on May 20th, 1498, Vasco de Gama landed near Calicut on the Malabar coast, after a voyage round the south of Africa. The Moors had previously been in possession of the inland trade of India, and it was not without a struggle that the Portuguese succeeded in establishing settlements on the coast of Malabar. The first Portuguese colonies were garrisons placed along the coasts of the continents and islands they visited for the security of their commerce, as Mozambique, Sofala, and Melinda on the east coast of Africa, Ormuz and Muscat, in the Persian Gulf; Goa, Diu, and Damao, on the Malabar coast of India. Goa became the capital of their Indian dominions. Colonies were established in Ceylon in 1505; in the Moluccas in 1510; Java, Sumatra, Celebes, and Borneo were also colonized, though the settlements there did not attain so great importance. The direction taken by the Portuguese navigators made them miss the discovery of America; but Brazil was discovered by Cabral in May, 1500, a few months after Pinçon, and was colonized by the Portuguese about 1530. The splendid colonial empire of which the foundations were thus laid was not destined to last. As in the case of Spain the energy of the Portuguese nation was trammelled by superstition, and this, together with a vicious colonial policy, had weakened the power of Portugal before she fell in 1580 under the dominion of Spain. The colonial possessions of Portugal were afterwards assailed by the Dutch as enemies of the Spaniards, and when she recovered her independence in 1640, many of them were irretrievably lost. Brazil declared its independence in 1822. The colonial possessions of Portugal are now mostly in Africa; the whole of her possessions in this continent embracing an area of over 5,000,000 square miles.

Soon after the Portuguese the Spaniards commenced the work of colonization. On October 12, 1492, Columbus discovered the island of San Salvador. Hayti, or San Domingo, named by Columbus Española, was discovered in the course of the same voyage, December, 1492, and immediately colonized. Porto Rico and Jamaica were colonized in 1509, Cuba in 1511. On the mainland a Spanish settlement was effected in Colombia (New Granada) in 1510. Mexico was conquered 1519–21; Ecuador, Venezuela, New Granada, Peru and Chili, were occupied and subdued between 1524 and 1541; and Spain was raised to the first rank among the colonizing powers of Europe. The Spaniards regarded their new possessions in various aspects. Some, animated by a zeal for religion, considered the conversion of the natives as the great end which Heaven had assigned to them. Others were inspired by the love of glory or the passion for gain, and scrupled at no means by which it was possible to gratify their wishes. The meaner motive especially prevailed with the greater number, and led to remorseless cruelty in the treatment of the subjugated peoples. To this result the discoveries of gold and silver made in the Spanish settlements greatly contributed, by causing a neglect of the development of their other great natural resources. In islands even so large as Jamaica and Cuba the natives were literally exterminated. On the continent they were reduced to a state of abject misery, and disorders were frequent among the colonists themselves. After many dissensions the government of the colonies, in its fundamental traits, was settled in 1532, during the reign of Charles V. A council of the Indies in Europe, viceroys, at first two, afterwards four, together with eight independent captains-general in America, were the heads of the administration. Cities were founded, at first along the coasts, for the sake of commerce and as military posts; afterwards also in the interior, especially in the vicinity of the mines; as Vera Cruz, Cumana, Porto Bello, Carthagena, Valencia, Caracas; Acapulco and Panamá, on the coast of the Pacific; Lima, Conception, and Buenos Ayres. The whole ecclesiastical discipline of the mother country was transferred to the colonies, except that in the latter the church was much more independent of the king. The intercourse with

Spain was confined at first to the single port of Seville, afterwards to that of Cadiz, from which two squadrons started annually. While, therefore, the commerce was not expressly granted by law to a society, it remained nevertheless entirely in the hands of a few individuals. Spain took possession of the Philippine Isles in 1564, and a regular intercourse was maintained from 1572 by the South Sea galleons, between Acapulco and Manilla; but owing to the great restrictions on commerce those islands, notwithstanding their advantageous situation, were an expense to the crown. Spain proved to be the foremost of the colonizing powers of Europe in respect to the formation of new states; the most unfortunate of all in regard to the retention of her possessions. The causes of the loss of her colonies differed from those which prevailed in the case of the Portuguese. European wars and the decline of her home power were the most important, but they did not so often lead to the colonies falling under other powers, as in the case of Portugal. They became more frequently the occasion of revolt, and the opportunity for declarations of independence on the part of the colonies themselves. Thus were formed the republics of Mexico, of Central America, of Venezuela, New Granada or Colombia, Ecuador, Peru, Bolivia, Chili, &c.; but as the bad government of the mother country served to promote this early defection, few of the states formed in this unfortunate school have yet attained the repose of settled government. An insurrection began in Cuba in 1895, and after Spain had in vain endeavoured to suppress it the United States interfered. War followed, with the result that after a brief struggle not only Cuba, but also Porto Rico and the Philippine Islands were lost to Spain.

The Dutch, during the struggle for their independence, first became the formidable rivals of the Portuguese, then subject to the Spanish yoke. They had already for some time carried on the trade in East India merchandise between Lisbon and the rest of Europe, but their intercourse with Lisbon was prohibited by Philip II. in 1584. The prohibition was revived in 1594 with the utmost severity, and a number of Dutch vessels in the harbour were seized. Excluded from the European trade in the productions of India, they resolved to import directly from India the articles which were refused to them in Europe. Companies were formed, which were united into one by a charter granted March 20, 1602, to the Dutch East India Company, established in 1595. This charter, which was renewed afterwards at different times, conferred not only the monopoly of the East India trade but also sovereign powers over the conquests which the Company should make, and the colonies which it should establish in India. An entirely new colonial policy was thus introduced, which instead of political or ecclesiastical aggrandizement, contemplated mercantile advantage as its main object. The Dutch colonies in the East Indies were thus commercial colonies; and the islands of the Malay Archipelago, being more easily defended than the continent of India, became the principal seat of the Dutch power. This was undoubtedly the chief cause of their colonies being so long in a flourishing condition, as they required only the dominion of the sea to maintain them. In 1619 the newly-built Batavia was made the capital of the Dutch East Indies. About the middle of the seventeenth century the power of the Dutch reached its highest point. They effected the establishment of a colony at the Cape of Good Hope in 1650, which afforded an excellent bulwark for their East India possessions, and took Ceylon from the Portuguese, after a long and sanguinary struggle in 1658. All the Dutch colonies in the East Indies were under the Governor-general of Batavia. In 1621 the Dutch established also a West India Company, which at first made extensive conquests in Brazil, but soon lost them entirely (1623–60). Their settlements on some of the smaller West India Islands, as San Eustatia, Curaçoa, Saba, and San Martin (1632–49), were more permanent. On the continent Surinam, Paramaribo, Essequibo, and Berbice were in the hands of the Dutch in 1667. The decline of the Dutch colonial power, partly caused by European wars and partly by the successful rivalry of the English, continued from the end of the seventeenth century till the French revolution. On the recovery of its independence, the commerce and the colonial importance of Holland somewhat revived, and though many of her colonies were lost, the value of the remainder was enhanced by improved administration. The Dutch still possess numerous colonial possessions in the East Indies, including Java, Sumatra, parts of Borneo, the Moluccas, and part of New Guinea; several small islands in the West Indies, and Surinam.

No colonizing power has had a career of such uniform prosperity as Great Britain. The freedom of her institutions, and the practical enterprise and self-reliance of her people peculiarly fitted her for the work of colonization, and it has steadily advanced with her equally in peace and in war. Her insular situation freeing her from the ambition of direct territorial aggrandizement, and giving her the command of the seas, enabled her in every war to strip her opponents of colonial possessions which were not unfrequently retained as the price of peace. The only break in a career of prosperity which has resulted in the formation of an empire greater in extent of territory and of population than any other known to history was the revolt of her American colonies, which resulted in the formation of a state destined ultimately to rival Great Britain herself in political and commercial importance and in the freedom of its institutions. This state, too, by the successful result of the war of 1898 with Spain, has itself entered on a policy of colonial expansion.

The English made their appearance as a colonial power nearly at the same time with the Dutch, but at first with far inferior success. They first visited remote seas during the reign of Queen Elizabeth. After many fruitless attempts to find a north-east or north-west passage to the East Indies, English vessels found their way round the Cape of Good Hope to the East Indies in 1591. In 1600 Elizabeth granted a charter to the East India Company. Their commerce with India, however, was not at first important. They established only single factories on the continent, and at the beginning of the eighteenth century the possessions of the English in the East were limited almost exclusively to Madras, Calcutta, and Bencoolen. The ruin of the Mogul Empire in India, which commenced in internal disturbances after the death of Aurengzebe (1707), and was completed by the incursions of Nadir Shah (1739), afforded the opportunity for the growth of British power, as the British and French were compelled to interfere in the contentions of the native princes and governors. The French, under Labourdonnaye and Dupleix, appeared at first likely to maintain the superiority; but the British succeeded in acquiring the ascendency in the Carnatic; and in the middle of the eighteenth century they greatly extended their dominions under Clive. By the destruction of Pondicherry they secured their superiority on the coast of Coromandel; and the victory of Clive at Plassey, June 26, 1756, laid the foundation of their exclusive sovereignty in India. By the

Treaty of Allahabad, Aug. 12, 1765, Bengal was surrendered to the British by the titular Great Mogul; and the fall of the Empire of Mysore, the dominions of Hyder Ali and Tippoo Saib, may be considered as completely establishing the British supremacy in India. The Mahrattas, with whom the British waged war at intervals from 1774 to 1818, and the Sikhs, subdued in 1849, remained the only formidable enemies of the Company. With the exception of a few dependent states the British territory now embraced nearly the whole of India, and this vast territory was still under the government of a chartered mercantile company, exercising many of the most important functions of an independent sovereignty. On the suppression of the Indian mutiny (1857–58) this state of things was deemed too hazardous to last, and the government of India was transferred to the crown by act of Parliament in 1858. Ceylon was first occupied in 1795–96.

The discoveries of the Cabots, following soon after the voyages of Columbus, gave the English crown a claim to North America, which in the reign of Elizabeth led to colonization on a large scale. In 1606 James I. divided the territory claimed by England into two parts—South Virginia, extending from Cape Fear to the Potomac; and North Virginia, from the mouth of the Hudson to Newfoundland. Two companies were formed for the colonization of America — the London Company, to which was granted South Virginia; and the Plymouth Company, to which was granted North Virginia. The region between the Potomac and the Hudson was neutral ground. The London Company in 1607 founded the commonwealth of Virginia by building Jamestown on the James River, so called in honour of the king. A House of Burgesses for the new colony met for the first time on 19th June, 1619, and thus was constituted the beginning of representative government in the British colonies of America. In 1614 Captain John Smith, having examined the coast from the Penobscot to Cape Cod, named the country here New England. The next permanent settlement on the North American coast was effected in this district by the body of Puritans, known as the Pilgrim Fathers, who sailed from England September 6, 1620, in the *Mayflower*, and landed 21st December in Massachusetts Bay. The government of this colony from the first was strictly republican. Another colony was established in New Hampshire in 1623, and in the same year Maine, which had previously been colonized by the French, received its first permanent English settlement. New Jersey was colonized in 1634. Connecticut was colonized in 1635 by emigrants from Massachusetts. Rhode Island was settled in 1636. Samuel Champlain, the French navigator, was the first European who entered the region now forming the state of New York (1609). In the same year Henry Hudson, an Englishman in the service of the Dutch East India Company, discovered the river to which his name has been given, where Dutch settlements were effected and gradually spread. The English, who claimed this territory as included in Cabot's discoveries, finally seized the Dutch colony of New Amsterdam by force in 1664, giving it the name of New York in honour of James, Duke of York (James II.), to whom Charles II. had made a grant of the province. In 1681 the territory west of the Delaware was granted to William Penn, who colonized it with Quakers, and founded Pennsylvania in 1682. The first settlement in Maryland was made in 1631 by a party from Virginia. In 1633 a colony of Roman Catholics arrived here from Britain. The country south of Virginia was permanently settled in 1670 by a party of English colonists who landed at Port Royal and afterwards removed to Charleston. The colony was called Carolina. Georgia, originally a part of Carolina, was granted by George II., after whom it was named, to a colony from England in 1732.

Colonies were early established in the West India Islands, including Barbados, half of St. Christopher's (1625), and soon after many smaller islands. Yet the West India possessions did not become important as plantations until the sugar-cane was introduced into Barbados in 1641 and into Jamaica in 1660. This island had been taken from the Spaniards in 1655. The cultivation of coffee was introduced into the West India Islands in 1732. Newfoundland was taken possession of by the English in 1583, and colonized in 1621 and 1633. Canada was surrendered by France to Britain at the Peace of Paris in 1763 (see section on French colonies below). In 1764 began the dispute between Britain and its North American colonies, on the question whether the former had the right to impose taxes on the colonies when they were not represented in the British Parliament; and on April 19, 1775, commenced the war which terminated with the acknowledgment of the independence of the thirteen provinces. Though the United States thus entered on their independent career, Canada still remains as a great and flourishing British dependency.

Australia was discovered in the beginning of the seventeenth century. The first Australasian settlements of Great Britain were penal colonies. New South Wales, discovered in 1770, was established as a penal colony in 1788; Tasmania (Van Diemen's Land), discovered by Tasman in 1642, followed in 1803. West Australia, for some time a penal settlement, was founded as a free colony in 1829; Victoria (Port Phillip) was colonized in 1835, and made an independent colony in 1851; South Australia was settled in 1836; Queensland became a separate colony in 1859; New Zealand, discovered by Tasman in 1742, began to be used in connection with the whale-fishery about 1790, was settled in 1839, and made a colony in 1840. In 1851 gold was discovered to be plentiful in Victoria. This gave a great impetus to the prosperity of the Australian colonies, and the influx of population it caused has largely contributed to promote their general development. The Fiji Islands became a colony in 1874, and other islands in the Pacific have been acquired since, as well as part of New Guinea and part of Borneo.

The acquisition of the South African colonies dates from the Napoleonic period, the Cape Colony and Mauritius being both secured to Britain in 1814. Natal was proclaimed a British colony in 1843. The Guinea Coast settlements date from the seventeenth century. Extensive protectorates or spheres of influence have also been recently acquired, being partly developed by chartered companies.

In Europe Great Britain has only two possessions of the nature of colonies, acquired for military reasons: Gibraltar in 1704; Malta and Gozo, 1800.

It is estimated that the existing British colonies and dependencies embrace fully one-fifth of the land-surface of the globe, and a rather larger proportion of its population. The whole of the British colonial possessions have been grouped in about forty administrative divisions, and they are situated in every quarter of the globe. (See BRITAIN.)

According to their governmental relations with the crown the colonies are arranged under three heads. (1.) Crown colonies, in which the crown has the entire control of legislation, while the administration is carried on by public officers under the control of the home government. (2.) Colonies possessing representative institutions but not responsible government, in which the crown has no more than a veto on legislation, but the home government retains the control of public officers. (3.) Colonies possessing representative institutions and responsible government, in which the crown has only a veto on legislation, and the home government has no control over any officer except the governor. All colonies are, however, disabled from such acts of independent sovereignty as the initiative in war, alliances, and diplomacy generally.

France was somewhat late of entering fully upon a colonial career, being retarded by internal dissensions and religious wars. Between 1627 and 1636 Pierre Belain d'Esnambuc colonized St. Christopher's, Guadeloupe and Martinique. Champlain was the pioneer of the French in the exploration of the North American continent, where they soon had considerable possessions, including Canada—in which they had settlements as early as 1604–5, and where Champlain founded Quebec in 1608—and Louisiana, colonized in 1699. Commercial companies were then deemed essential in colonizing, and a West India Company and an East India Company were established by Colbert in 1664. He purchased on several West India Islands, as Martinique, Guadeloupe, St. Lucia, Grenada, and others, settlements already formed by private persons, and sent out colonists in 1664 to Cayenne. But the settlements in part of St. Domingo, by the buccaneers, became of more importance than those effected by the government. The West India Company survived only ten years. The East India Company, after fruitless attempts to form a colony in Madagascar, founded Pondicherry on the Coromandel coast in 1670. This became the capital of extensive French possessions in the East Indies. The French also acquired the Île de France (Mauritius) and Bourbon (Réunion), occupied in 1720. At the beginning of the eighteenth century France had attained an important position as a colonial power. In North America her settlements extended from Canada to California, particularly along the great lakes and the Mississippi river, embracing many districts which have since become of the highest importance. Nova Scotia (Acadie) and Newfoundland (Terre Neuve), which had been disputed with Great Britain, were then in her possession. Her West India Islands were more flourishing than those of England, and she still had a prosperous career before her in India. The superiority of the fleet of England gave that power a great advantage in colonial contests, and many of the French colonies subsequently fell under the power of Great Britain. The struggle for the supremacy in India, though France was finally unsuccessful, was long and gallantly maintained, and more than once seemed to promise a different issue. The North American colonies were partly lost by conquest and partly suffered to fall into decay. Of the West India possessions several were taken by Great Britain, and finally ceded to her. Canada was finally ceded to England in 1763; Louisiana, after being surrendered to Spain, to prevent it from falling into the hands of the English, was sold by Napoleon to the United States in 1803. At the general pacification of 1815 France recovered some remains of her colonial possessions, and since then she has acquired extensive regions beyond sea, some of them highly valuable. She occupied in 1830 and begun in 1838 to colonize Algeria, a country whose irregular and lawless government had exposed her as well as other European states to frequent annoyance. Tunis, Senegambia, great tracts of the Sahara, Sudan, and Congo regions, the islands of Madagascar and Réunion, are all comprised in France's African possessions, while in Asia she possesses a large portion of the Indo-Chinese peninsula, and in America French Guiana. Some of the French colonies are represented in the National Assembly by members chosen for the purpose.

Denmark established an East India Company in 1618 with a view to enter on the colonial trade; and other companies were afterwards formed. In the same year with the formation of the first company, the colony of Tranquebar was founded on the Coromandel coast. Its success was fluctuating, like that of the companies formed to manage it, and at last, in 1845, it was sold to the East India Company. St. Thomas in the West Indies was settled by the Danes in 1672; St. John and some of the smaller islands in the same group (the Virgin Islands) were also occupied by them. The island of Santa Cruz was purchased from France in 1733. These islands were sold to the United States in 1902. Sweden established an East India Company in 1741. She acquired the island of St. Bartholomew from France in 1785, but restored it in 1878, and has now no colonies.

Germany has recently been making some attempts at establishing colonies in different parts of the world, and has in this way acquired considerable tracts in South Africa (east and west), New Guinea, &c. Italy has also shown the same ambition, and has established a colony on the African side of the Red Sea, between it and Abyssinia.

The colonial policy of such despotic countries as Spain and Portugal naturally differed from that of freer nations like England and Holland. In the former the great expense and risk of colonizing was borne by the government, who retained direct control over the colonies and their productions; but in the latter the work, being too much for individual enterprise, was entrusted to companies, whose charters conferred on them not only exclusive privileges in regard to trading, but also extensive powers of conquest and administration. In respect of trade a very exclusive and jealous policy long prevailed, but since the adoption of a free-trade policy in Great Britain, the whole trade of her colonies has been thrown open without reserve, as far as the privileges of the mother country are concerned, to the competition of foreign nations. Other countries, while not following her commercial policy entirely, have relaxed more or less the stringency of the regulations affecting their colonial trade.

SUPPLEMENT.

CAABA. See Kaaba.

CAAMA. See Hartebeest in Supp. and Antelope.

CABALLERO, Fernan, pseudonym of Cecilia Böhl von Faber, the chief modern Spanish novelist, daughter of a German settled in Spain and married to a Spanish lady, was born at Morges, near Lausanne, on Dec. 25th, 1796, and died at Seville on April 7th, 1877. Brought up in Germany, she went to Cadiz with her father in 1813. Her first novel, La Gaviota, appeared in 1849, and was followed by Elia, Clemencia, La Familia de Alvareda, &c., as well as by many shorter stories. In 1859 she published a collection of folk-tales under the title Cuentos y Poesias Populares Andaluces. Some of her works have appeared in English translations, including La Gaviota (tr. as the Sea-Gull, 1867); Elia: or Spain fifty years ago (1868); Air-Built Castles; and The Bird of Truth (1881). The chief charm of her writings lies in her descriptions of life and nature in Andalusia. She was three times left a widow; her last husband was a lawyer named De Arrom. She forms the subject of one of the Six Life Studies (1880) of M. B. Edwards.

CABBAGE-BARK. See Andira in Supp.

CABBAGE-ROSE, a species of rose (*Rosa centifolia*) of many varieties, supposed to have been cultivated from ancient times, and eminently fitted from its fragrance for the manufacture of rose-water and attar. It has a large, rounded, and compact flower. It is called also *Provence* (or more correctly *Provins*) *Rose*, from a town in the French department of Seine-et-Marne where it is much cultivated.

CABBAGE-TREE, a name given to the cabbage-palm, and also to a tree of the genus *Andira* (which see in Supp.).

CABEIRI. See Cabiri.

CABINDA, a Portuguese seaport and territory, north of the Congo mouth. The territory is bounded by the Atlantic on the west, the Congo Free State on the south, and French Congo on the north. The town, situated about 40 miles north of the mouth of the Congo, carries on a considerable trade, and its people are noted for their shipbuilding and other handicrafts. Pop. 10,000.

CABLE, George Washington, American novelist and miscellaneous writer, was born at New Orleans on Oct. 12th, 1844. His father died when he was fourteen years of age, and he had to leave school and seek employment as a clerk in order to support his mother and sisters. In 1863 he joined the Confederate army as soldier in a cavalry regiment, and served till the conclusion of the Civil War two years afterwards, when he returned to New Orleans and again took to commercial life. Latterly he attained an important position in a cotton firm, but in 1879, being by this time a practised writer, and having had considerable success with his literary ventures, he decided to devote himself entirely to authorship. In 1884 he took up his residence in Massachusetts, where he has originated a system of 'home culture clubs'. His first important book, Old Creole Days (1879), appeared originally in Scribner's Monthly; and since its publication he has written The Grandissimes (1880); Madame Delphine (1881); The Creoles of Louisiana (1884), a history; Dr. Sevier (1884); The Silent South (1885), a plea for the negro; Bonaventure (1888); The Negro Question (1888); Strange True Stories of Louisiana (1889); and John March (1894). He has given successful public readings from his works in many parts of the States and also in England. For most readers the chief interest of Mr. Cable's novels lies in their excellent descriptions of Creole life, a subject which he may be said to have introduced into literature. His pictures of negro life are equally effective, and he handles dialect in a masterly manner.

CABRAL, Pedro Alvarez, the discoverer (or second discoverer) of Brazil, a Portuguese, was born about 1460 and died about 1526. In 1500 he received command of a fleet bound for the East Indies, and sailed from Lisbon, but having taken a course too far to the west he was carried by the South American current to the coast of Brazil, of which he took possession about April 24th, 1500, in the name of Portugal. Continuing his voyage, he lost several ships and men in a storm, but with the remainder he visited Mozambique, and at last reached India, where he made important commercial treaties with native princes, and then returned to Europe.

CACHAR, or Cachar Plains, a district of India, in Assam; area, 2472 sq. miles. Some minerals are found, but the natural wealth of the district consists mostly in its extensive forests. It is intersected by a railway. Pop. (1891), 367,542, almost entirely engaged either in rice cultivation or on the tea plantations. The chief towns are Silchar and Gunjong. —North Cachar forms a separate district; area, 1728 sq. miles. Pop. 18,941.

CACHEXY, Cachexia (Gr., 'evil habit of body'), a morbid state of the bodily system, in which there is great weakness, with or without the local manifestation of some constitutional disease. It is not a disease of itself, but the result of diseases such as gout, cancer, lead-poisoning, &c. Thus the *scrofulous cachexia* means the condition of body due to scrofula, shown by slender form, narrow or deformed chest, pallor, diseased glands, large, prominent joints, &c.

CACHOLONG, a mineral of the quartz family, a variety of opal, and so often called *Pearl-opal*, usually milk-white, sometimes grayish or yellowish-white, opaque or slightly translucent at the edges.

CACHOU, a sweetmeat in the form of a pill, made from the extract of liquorice, cashew-nut, gum, &c., used by smokers to sweeten the breath.

CACODYLE. See Alkarsin in Supp.

CACOLET, a contrivance somewhat resembling a double arm-chair, or in other cases like a bed, fixed on the back of a mule or horse, for carrying sick persons or travellers in mountainous countries. Cacolets have also been used in warfare for carrying wounded soldiers.

CADDIS-FLIES. See NEUROPTERA.

CADET'S FUMING LIQUOR. See ALKARSIN in SUPP.

CADOUDAL, GEORGES, See CHOUANS.

CÆCILIA (L. *cæcus*, blind, from the minute size of their eyes), a genus of amphibians, type of the family Cæciliidæ. They are vermiform, covered with small scales, entirely destitute of limbs, and the eyes are very small and nearly hidden by the skin. They are usually 1 to 2 feet in length, but often much longer. The family constitutes the order Apoda of the class Amphibia.

CÆCUM, a blind process or sac in the alimentary canal of various animals. In fishes the cæca are often numerous and long; and birds have generally two near the termination of the intestine. Mammals have commonly only one *cæcum*. In man the 'blind-gut' is small and situated at the beginning of the colon. See INTESTINE.

CAEN-STONE, the French equivalent for the Bath oolite of England, a cream-coloured building stone of excellent quality, got near Caen in Normandy. Winchester and Canterbury Cathedrals, Henry VII.'s Chapel at Westminster, and many churches are built of it.

CAFFRE-CORN, a variety of millet (*Sorghum vulgare*). See SORGHUM.

CAINE, THOMAS HENRY HALL, novelist, dramatist, and general writer, was born at Runcorn, Cheshire, on May 14th, 1853, of Manx and English parents. He received his education in the Isle of Man and at Liverpool, and qualified as an architect, but abandoned architecture in order to become a journalist. He lived in London with Dante Gabriel Rossetti from 1881 till the latter's death in 1882, and in that year appeared his Recollections of Rossetti. He had previously published Richard III. and Macbeth (1877), a critical work, and Sonnets of Three Centuries (1882). In 1883 appeared his Cobwebs of Criticism, a review of the contemporary critiques of Wordsworth, Shelley, Byron, Keats, and other poets; and in 1887 he contributed to the Great Writers series a Life of Coleridge. His first novel was The Shadow of a Crime (1885), followed next year by A Son of Hagar; but the Deemster (1887), since dramatised (as Ben-my-Chree), first brought him into prominent notice. His subsequent novels include The Bondman (1890), The Scapegoat (1891), The Prophet (1892), The Manxman (1894), and The Christian (1897). Mr. Caine has travelled in Morocco, Iceland, Russia, and North America, and he acted in Canada as representative of the Society of Authors in negotiations concerning Canadian copyright. His most successful novels deal with Manx life, in the description of which he reveals intimate knowledge of his subject and very considerable literary power and skill.

CAINOZOIC, a geological term (from Gr. *kainos*, recent, and *zoe*, life) applied to the latest of the three divisions into which strata have been arranged, with reference to the age of the fossils they include. The *Cainozoic* system embraces the tertiary and post-tertiary systems of British geologists, exhibiting recent forms of life, in contradistinction to the *Mesozoic*, exhibiting intermediate, and the *Palæozoic*, ancient and extinct forms. It corresponds nearly with what has been called the age of mammals. See GEOLOGY.

CAIRD JOHN, Scottish divine, born at Greenock in Dec. 1820, where his father was member of a firm of ironfounders and engineers. He was educated at the Grammar School of Greenock, and at Glasgow University, where he took a high place both in arts and divinity. Having entered the ministry of the Church of Scotland, in 1845 he became minister of Newton-upon-Ayr, and two years later he was transferred to Lady Yester's parish church, Edinburgh. Between that date and 1862, when he became professor of divinity in Glasgow University, he was minister of Errol, Perthshire (1849–57), and of Park Church, Glasgow (1857–62). In 1873 he was elected principal of his university, a position which he held till his resignation in 1898. He died on July 30th of this year, before his resignation had taken effect. He published sermons (his sermon Religion in Common Life, preached before the queen, had an immense circulation, and was described by Dean Stanley as the greatest sermon of the century); Introduction to the Philosophy of Religion (1880); and Spinoza (1888) in Blackwood's Philosophical Classics. In 1899 appeared The Fundamental Ideas of Christianity (two vols.), under the editorship of his brother, being the Gifford Lectures delivered in 1891–92 and 1895–96, accompanied by a memoir of the author.—His brother EDWARD, born at Greenock in 1835, and educated in his native town and at the Universities of Glasgow and Oxford (Balliol College), was fellow and tutor of Merton College, and was professor of moral philosophy at Glasgow from 1866 till 1893, the year of his appointment as Master of Balliol College, Oxford, in which post he succeeded Prof. Jowett. He is author of Account of the Philosophy of Kant (1878); Social Philosophy and Religion of Comte (1885); the book on Hegel in Blackwood's Series of Philosophical Classics (1883); Critical Philosophy of Immanuel Kant (1889); Esssays on Literature and Philosophy (1892); and The Evolution of Religion (1893, being the St. Andrews Gifford Lectures of 1891–92).

CAIRNES, JOHN ELLIOT, economist, was born at Castle Bellingham, County Louth, on 26th Dec. 1823. After an education at Kingstown and Chester he was for a time employed in his father's brewery at Drogheda, but he ultimately went to Trinity College, Dublin. He graduated as M.A. in 1854, and two years afterwards was appointed Whately professor of political economy at Dublin. His first series of lectures was published in 1857, under the title The Character and Logical Method of Political Economy. In 1859 he was elected professor of political economy and jurisprudence in Queen's College, Galway, and seven years later he was appointed to the corresponding chair in University College, London; but in 1872 the state of his health compelled him to give up active teaching. He had been called to the Irish bar in 1857, but he hardly ever practised. During the later years of his life he suffered much from the effects of an accident to his knee, which befell him while hunting in 1860, and for some time before his death, which took place July 8th, 1875, he was completely crippled. In 1862 he issued a work in defence of the Northern States of America, entitled The Slave Power, which had a very large circulation. The most important of his other works are Essays on Political Economy, Theoretical and Applied (1873), and Some Leading Principles of Political Economy newly Expounded (1874). He takes rank as one of the leading economists of the nineteenth century.

CAIRO, a river-port of the United States, capital of Alexander county, Illinois, at the junction of the Ohio and the Mississippi. Its natural advantages have been somewhat nullified by its liability to floods, but it is now protected by means of levees. It is a depôt for goods going to and from the surrounding districts, and has important manufactures and a considerable shipping trade. Pop. (1890), 10,324.

CAJAMARCA. See CAXAMARCA.

CAJUPUT. Same as CAJEPUT.

CALABA-OIL, an excellent illuminating oil obtained from *calaba-nuts*, the seeds of *Calophyllum Calaba*, a tree of the order Guttiferæ that flourishes in Brazil and the West Indies, and yields useful timber.

CALABAR BEAN, the seed of *Physostigma venenosum*, a leguminous African plant, nearly allied to the kidney-bean. It is a powerful narcotic poison, operating also as a purgative and emetic, and in virtue of these last qualities is the famous 'ordeal bean' of Africa, administered to persons suspected of witchcraft. If it causes purging it indicates crime; if vomiting, innocence. It induces fainting fits and asphyxia, and weakens or paralyses the action of the heart. It is employed in medicine, chiefly (externally) as an agent for producing contraction of the pupil of the eye in certain cases; sometimes also (internally) in neuralgia, tetanus, and rheumatism. The active principle of the plant is known as *physostigmin* or *eserin*.

CALADIUM, a genus of plants belonging to the order Araceæ, natives of tropical South America, often cultivated in hothouses on account of their large sagittate, finely coloured leaves. There are seven species, including *C. bicolor*, *C. picturatum*, *C. Belleymei*, and *C. esculentum*, the last of which is usually referred to the genus *Colocasia*.

CALAIS, a town of the United States, capital of Washington county, Maine, on the river St. Croix, at the head of navigation, about 264 miles north-east of Portland. Facing it on the opposite side of the river, which is here crossed by bridges, is St. Stephens in New Brunswick. It is a centre of the lumber trade, and shipbuilding and iron-founding are among its industries. Pop. (1890), 7290.

CALAMBAC, a fragrant wood, same as *Agila* or *Agallochum*. See AGALLOCHUM in SUPP.

CALAMINT, any plant of the genus *Calamintha*, belonging to the natural order Labiatæ. The plants are herbs or shrubs with usually entire leaves, and dense whorls of purple-white or yellow flowers, with a two-lipped corolla and didynamous stamens not projecting from the corolla. Five species are British, viz. *C. Nepeta*, lesser calamint; *C. officinalis*, common calamint; *C. sylvatica*, wood-calamint; *C. Acinos*, basil-thyme; and *C. Clinopodium*, wild-basil. They all contain a volatile oil.

CALAMUS, in Scripture, the word used to translate a Hebrew term which is believed to mean an aromatic substance obtained from some kind of reed or cane, probably *Andropogon Schœnanthus* (sweet-scented lemon-grass) or the root of the sweet-flag or sweet-rush (*Acorus Calamus*). This term occurs three times in the Authorized Version, namely, in Ex. xxx. 23, Cant. iv. 14, and Ezek. xxvii. 19. See SWEET-FLAG.

CALCAREOUS, a term applied to substances partaking of the nature of lime, or containing quantities of lime. Thus, we speak of calcareous waters, calcareous rocks, carcareous soils. *Calcareous spar* is crystallized carbonate of lime. It is found crystallized in more than 700 different forms, all having for their primitive form an obtuse rhomboid. The rarest and most beautiful crystals are found in Derbyshire. *Calcareous tufa* is an alluvial deposit of carbonate of lime, formed generally by springs, which, issuing through limestone strata, hold in solution a portion of calcareous earth; this they deposit on coming in contact with air and light. Calc-sinter is a variety of it.

CALC-SINTER, a form of carbonate of lime, the substance which forms the stalactites and stalagmites that beautify many caves. It is the same as travertine (which see).

CALDECOTT, RANDOLPH, artist, was born at Chester on Mar. 22nd, 1846. He entered a bank at Whitchurch, Salop, and was afterwards transferred to Manchester, but he ultimately gave up banking for art. His first success was the publication, in 1875, of his illustrations of a volume of selections from Washington Irving's Sketch-book, under the title of Old Christmas. It was followed by his illustrations of the same author's Bracebridge Hall (1876), Mrs. Carr's North Italian Folk (1877), Blackburn's Breton Folk (1879), and Æsop's Fables with Modern Instances (1883). His most popular work, however, was the series of coloured children's books commenced by him in 1878, and including John Gilpin, the Elegy on the Death of a Mad Dog, and the Great Panjandrum. He died at St. Augustine, Florida, on Feb. 12th, 1886.

CALDERON, PHILIP HERMOGENES, painter, was born at Poitiers in May, 1833, his father being the Rev. Juan Calderon, at one time professor of Spanish literature in King's College, London. Coming to England about 1845, he became shortly afterwards the pupil of a civil engineer; but his artistic ability was so pronounced that his father allowed him to devote himself to the study of art at the British Museum and the National Gallery. In 1850 he entered Mr. Leigh's Art School, and three years later he went to study under Picot at the École des Beaux Arts in Paris. He first exhibited at the Academy in 1853, his picture being named By the Waters of Babylon. Amongst the many pictures he subsequently produced may be mentioned Broken Vows (1857); Far Away (1858); The Gaoler's Daughter (1858); Never More (1860); Liberating Prisoners on the Young Heir's Birthday (1861); After the Battle (1862), one of his most successful; The English Embassy in Paris on the Day of the Massacre of St. Bartholomew (1863); Her Most High, Noble, and Puissant Grace (1865), the last two being probably his finest works; Whither? (1867—his diploma picture); Sighing his Soul out in his Lady's Face (1869); Spring driving away Winter (1870); On her Way to the Throne (1871), a sequel to his masterpiece of 1865; Victory (1873); Half-hours with the Best Authors; La Gloire de Dijon (1878); Home they brought her Warrior Dead; Aphrodite; The Answer (1897); and Ruth (1897). Elected A.R.A. in 1864, he became three years later a full academician. He gained in 1867 the first French gold medal awarded to an English artist. He died in London on April 30th, 1898.

CALDERWOOD, HENRY, philosopher, was born at Peebles on May 10th, 1830, and received his early education at the Edinburgh Institution and High School. He afterwards attended the university of that city, and whilst still a student published his Philosophy of the Infinite (1854), an attempt to controvert the views of Sir William Hamilton. He became minister of Greyfriars United Presbyterian Church, Glasgow, in 1856, and in 1868 he was elected professor of moral philosophy in Edinburgh University, a chair which he occupied for the rest of his life. His death took place on Nov. 19th, 1897. His chief works are his Handbook of Moral Philosophy (1872); Relations of Mind and Brain (1881); and Evolution and Man's Place in Nature (1893; 2nd ed. 1896).

CALEDONIAN CANAL. See CANAL.

CALGARY, a rising town of Canada, capital of the district of Alberta, on the Bow River, about 840 miles west of Winnipeg. It is on the Canadian

Pacific Railway, at the junction of the line running north to Edmonton and south to Fort Macleod. There are various churches, a public and a convent school, a court-house, hospitals, &c., and various manufactures have been established. It is the centre of an important cattle and horse-ranching district. Good building stone is quarried in the neighbourhood. Calgary has grown up since 1880. Pop. (1891), 3876.

CALICO (from *Calicut* in India), a general term for any plain white cotton cloth: in America it is usually applied to printed cottons. See Calico Printing.

CALISAYA BARK or Bolivian Bark, a variety of Peruvian or cinchona bark, namely, that of *Cinchona calisaya* or *flava.*

CALIVER, an early form of hand-gun, musket, or arquebuse, lighter and shorter than the original musket, fired without a rest and much more rapidly. It seems to have gone out of fashion about 1630.

CALLERNISH, a village and district of Scotland, in the island of Lewis, on Loch Roag, 16 miles west of Stornoway, famous for its circles of standing-stones. The main circle is 40 feet in diameter, formed of twelve unhewn blocks of gneiss from 10 to 13 feet high, with a larger block in the centre. From this circle rows of stones project to the east, west, and south. There are upwards of forty blocks altogether. Pop. (1891), 311.

CALLINUS, of Ephesus, the earliest Greek elegiac poet, flourished probably in the seventh century before Christ. Only a few fragments of his elegies are extant; these have been edited by several scholars, among them Bergk (in the Poetæ Lyrici Græci).

CALLISTHENICS (Gr. *kalli-*, beautiful, and *sthenos*, strength), the art or practice of exercising the body for the purpose of giving strength to the muscles and grace to the carriage. The term is usually applied to the physical exercises of females, as gymnastics is to those of males.

CALOPHYLLUM, a genus of plants, belonging to the natural order Guttiferæ, consisting of large timber trees, with shining leaves which have numerous transverse parallel veins. *C. Inophyllum* yields a medical resin, the tacamahac of the East Indies. The seeds afford an oil which is used for burning, for making ointment, &c. *C. Calaba* is a West Indian species which yields an oil used for illuminating purposes. See Calaba-oil in Supp.

CALORIMETER, an apparatus for measuring absolute quantities of heat, or the specific or latent heat of bodies. The determination is commonly effected by means of observing the quantity of ice melted by a body in cooling, or the rise of temperature produced in a known quantity of water.

CALPURNIUS, Titus, a Latin pastoral poet, born in Sicily about the end of the third century. Eleven eclogues composed by him are extant, but nothing whatever is known with certainty about his life, and even his name is doubtful. The poems attributed to him are evidently modelled on Virgil's more famous eclogues. They are smooth, flowing, and melodious, but lacking in simplicity and naturalness.

CALTHA, the genus of ranunculaceous plants to which the marsh-marigold (*C. palustris*) belongs. See Marsh-marigold.

CALVERLEY, Charles Stuart, poet, son of the Rev. Henry Blayds, was born at Martley, Worcestershire, on Dec. 22nd, 1831. In 1852 his father dropped the name of Blayds and resumed that of Calverley, formerly borne by his family. Charles, after some years at Harrow, in 1850 entered Balliol College, Oxford, but in 1852 he was removed owing to some thoughtless offences against discipline, and in the following year he went to Christ's College, Cambridge. During his college career he showed great skill in Latin and Greek composition, and in 1856 he was second in the classical tripos. As a writer of humorous English verse he also made himself famous. He afterwards studied for the bar, and was called in 1865, but his promising legal career was cut short by a serious accident which befell him on the ice in the winter of 1866–67. The effects of this misfortune clouded the whole of the remainder of his life, and latterly he also suffered from kidney disease. He died on Feb. 17th, 1884. As a parodist and writer of light verses Calverley is perhaps unequalled, but his published volumes are not numerous. The earliest of them appeared in 1862 under the title of Verses and Translations; and the others are: Translations into English and Latin (1866), Theocritus translated into English Verse (1869), and Fly Leaves (1872). A Memoir and Literary Remains were published in 1885 by W. J. Sendall, and in 1888 an edition of his works appeared in four volumes, a one-volume edition being issued in 1901.

CALYCANTHUS, a genus of hardy American shrubs, type of the order Calycanthaceæ, which is usually placed near Magnoliaceæ. One species, Florida allspice (*C. floridus*), has yellow flowers and is sweet-scented. It is also used in medicine. The only other genus of the order is *Chimonanthus.*

CALYSTEGIA. See Bind-weed in Supp.

CAM, an English river formed by the junction of two streams one of which (the Granta) rises in Essex and flows north-west, whilst the other (the Rhee) rises in the north of Herts and flows north-east. The united stream flows sluggishly northwards through Cambridgeshire, and falls into the Ouse some 4 miles south of Ely after a course of about 40 miles. The university town of Cambridge is situated on its banks a few miles below the confluence of the head-streams. It is navigable to Cambridge.

CAM, in machinery, a simple contrivance for converting a uniform rotatory motion into a varied rectilinear motion, usually a projecting part of a wheel or other revolving piece so placed as to give an alternating or varying motion to another piece that comes in contact with it and is free to move only in a certain direction.

CAMBUSLANG, a flourishing town of Scotland on the left bank of the Clyde, about 3 miles s.e. of Glasgow, with collieries adjacent. Many persons engaged in business in Glasgow reside here. Pop. (1891), 8323; (1898), 17,000.

CAMEL, a water-tight box or caisson used to raise a sunken vessel, or to float a vessel over a shoal or bar. It is let down with water in it, and is attached to the vessel, after which the water is pumped out, and the camel rises from its buoyancy.

CAMERON, Verney Lovett, African traveller, was a son of the Rev. J. H. L. Cameron, vicar of Shoreham, and was born near Weymouth on July 1st, 1844. He entered the British navy in 1857, and in 1872 was chosen by the Royal Geographical Society of London to conduct an expedition for the relief of Dr. Livingstone. He was only in time to meet the remains of Livingstone at Unyanyembe, but pushed onward to Ujiji on Lake Tanganyika, partly circumnavigated this great sheet of water, establishing the fact that its outlet was the Lukuga. Not being able to follow the Lualaba river downwards, he continued his journey westwards to Benguela, and was thus the first to cross tropical Africa from east to west. Returning to England in 1876, he was made Companion of the Bath, and raised to the rank of a commander. In 1878 he made a journey through Asia Minor and Persia in order to satisfy himself as to the feasibility of a railroad connecting India with the Mediterranean, and in 1882 he and Sir Richard Burton explored the country behind the Gold Coast. He published accounts of his journeys in his Across Africa (1877), Our Future Highway to India (1880), and To the Gold Coast for Gold (1883, with Sir R. F. Burton), besides several other books. He died at Leighton Buzzard on March 26th, 1894, from an accident in the hunting field.

CAMERON HIGHLANDERS, the old 79th Regiment in the British army, raised in 1793 by Allan Cameron of Erroch. It wears the Highland dress and now forms the first battalion of the Queen's Own Cameron Highlanders. There is not as yet a second battalion linked with it.

CAMERONIAN REGIMENT, a British regiment raised in 1689 amongst the Cameronians of the West of Scotland to support William III., and long famous as the 26th Regiment. It forms now the first battalion of the Cameronians (Scottish Rifles), the second battalion being the old 90th Regiment.

CAMPANERO, the bell-bird, which see in SUPP.

CAMPBELL, Sir COLIN. See CLYDE, LORD.

CAMPBELL, REV. LEWIS, classical scholar, was born at Edinburgh on Sept. 3rd, 1830, his father, a commander in the navy, being a relative of Thomas Campbell, the poet. He received his early education at Edinburgh Academy, and he afterwards attended Glasgow University and Trinity and Balliol Colleges, Oxford, taking the degree of B.A. (with first-class honours in classics) in 1853, and that of M.A. in 1856. Ordained in 1857, he became vicar of Milford, Hants, in the following year, a post which he held till his appointment, in 1863, as professor of Greek in St. Andrews University. He retired from this chair in 1892, becoming emeritus professor. The 1894-95 series of Gifford Lectures at St. Andrews was delivered by him. As a writer he is known chiefly by his editions and translations of ancient Greek authors, the chief of them being Plato's Theætetus (1861, 2nd ed. 1883); Plato's Sophistes and Politicus (1867); Sophocles — The Plays and Fragments (1879 and 1881, 2 vols.); Sophocles in English Verse (1873-83, new ed. 1897); Æschylus in English Verse (1890); and Plato's Republic (along with the late Prof. Jowett, 1894). The Christian Ideal, published in 1877, is a volume of sermons; and his other works include Guide to Greek Tragedy (1891); Life of James Clerk Maxwell (with Mr. W. Garnett, 1882, 2nd ed. 1884); Life of Benjamin Jowett (along with Rev. E. Abbott, 1897); Religion in Greek Literature (1898), the substance of his Gifford Lectures; the articles Plato and Sophocles in the Encyclopædia Britannica, &c.

CAMPHENE, the generic name for the volatile oils or hydrocarbons, isomeric or polymeric with oil of turpentine, and having therefore the general formula $C_{10}H_{16}$, as oil of bergamot, cloves, copaiba, hops, juniper, orange, pepper, &c. They are liquid at ordinary temperatures, and are distinguished from each other by their odours.

CAMPHINE, the commercial term for purified oil of turpentine, obtained by distilling the oil over quicklime to free it from resin. It is used in lamps, and gives a very brilliant light; but, to prevent smoking, the lamp must have a very strong draught. With oxygen it forms camphor. See also preceding article.

CAMPION, EDMUND, an English Jesuit, was born in London on Jan. 25th, 1540. He was educated at Christ's Hospital and St. John's College, Oxford, and distinguished himself greatly, becoming B.A. in 1561 and M.A. in 1564. Though at first a Roman Catholic, he adopted nominally the Reformed faith and took deacon's orders in the Church of England; but he afterwards recanted, studied theology at Douay, became a Jesuit, was ordained deacon and priest, and attacked Protestantism, especially in his work Decem Rationes (Ten Reasons). He became an active member of the Roman Catholic mission in England, and in 1581 he was found guilty on a trumped-up charge of conspiring to raise sedition, and was accordingly executed on Dec. 1st. His biography has been written by Richard Simpson (London, 1867).

CAMPO-SANTO (lit. 'Holy Field'), the name given to a burying-ground in Italy, best known as the appellation of the more remarkable, such as are surrounded with arcades and richly adorned. The most famous Campo-Santo is that of Pisa, which dates from the twelfth century, and has on its walls frescoes of the fourteenth century of great interest in the history of art. Amongst more modern Italian cemeteries, that of Genoa is distinguished for its magnificence.

CANAANITES, the general name for the heathen peoples (Jebusites, Hittites, Amorites, &c.) whom the Israelites found dwelling in Canaan (Palestine) west of the Jordan, and whom latterly they utterly subdued, though the subjugation was not quite complete till Solomon's time. They are believed to have been, in part at least, of kindred race with the Israelites; and some authorities find traces of their descendants among the present inhabitants of Palestine. The name Canaanites was also applied in a more restricted sense to one of these peoples.

CANADA HEMP, or INDIAN HEMP, a perennial herb, *Apocynum cannabinum*, of the dogbane family (Apocynaceæ), a native of North America. It has a strong fibre used by the Indians for twine, nets, woven fabrics, &c.

CANADA RICE (*Zizania aquatica*), a floating grass growing in lakes and sluggish streams in Canada and the northern United States, yielding a grain that forms part of the food of the Indians, and is eaten by whites also. It is also known as *wild*, *water*, or *Indian rice.*

CANADIAN RIVER, a river of the United States, in New Mexico, Texas, Oklahoma, and Indian Territory, a tributary of the Arkansas; length, 900 miles.

CANADIAN TURPENTINE. Same as *Canada Balsam* (which see).

CANANDAIGUA, a beautiful lake in the west of New York state, mostly in Ontario county. It is 15 miles long and from ¾ to 1½ wide, with a small town of the same name on its banks. The town is situated at the north end of the lake, 28 miles southeast of Rochester. It is very popular as a pleasure resort. Pop. (1890), 5868.

CANARY, a wine not unlike Madeira, made in the Canary Islands, chiefly at Teneriffe.

CANARY-FLOWER (*Tropæolum peregrinum*) an annual climbing plant of the Indian cress section of the Geranium family, a native of South America, cultivated in Europe for its showy yellow flowers.

CANARY-WOOD, the light orange-coloured wood of *Persea indica* and *P. canariensis*, trees of the laurel family belonging to the Canaries and Madeira.

CANASTER, originally, the rush-basket in which South American tobacco was packed and exported, and hence applied to a kind of tobacco consisting of the leaves coarsely broken for smoking.

CANDLE-FISH, also called Oolakan, Oulachon, or Eulachon, a sea-fish of the salmon family, the *Thaleichthys pacificus*, frequenting the north-western shores of America, of about the size of the smelt, which it somewhat resembles. It is converted by the Indians into a candle simply by passing the pith of a rush or a strip of the bark of the cypress-tree through it as a wick, when its extreme oiliness keeps the wick blazing. Oulachon oil, a substitute for cod-liver oil, is obtained from it. This fish is a favourite article of food in British Columbia.

CANDLE-NUT, the nut of *Aleurites triloba*, the candleberry-tree, a native of the Moluccas, Pacific Islands, &c., belonging to the natural order Euphorbiaceæ. It is about the size of a walnut, and yields an oil used for food and for lamps, while the oily kernels are also strung together and lighted as torches.

CANDLISH, Robert Smith, D.D., a Scottish divine, was born at Edinburgh in 1806, and educated at Glasgow University. In 1828 he was licensed as a preacher, and in 1834 was transferred from Bonhill to St. George's, Edinburgh. In 1839 he threw himself into the conflict with the civil courts in the matter of the congregational right of election and independent church jurisdiction in matters spiritual, and soon became, next to Chalmers, the most prominent leader of the 'non-intrusion' party and of the movement that culminated in the Disruption of 1843, and the formation of the Free Church of Scotland. From the death of Chalmers till his own death, which took place at Edinburgh on Oct. 19th, 1873, Candlish was the ruling spirit in the Free Church. In 1862 he was made principal of the New College (the theological college of the Free Church), Edinburgh. He was the author of several popular books on religious subjects. See the Life by Dr. Wilson (1880).

CANDY, a measure of weight in the East Indies. In Madras the candy is equal to 493·7 pounds, in Bombay it is 560 pounds, and in Ceylon it is equal to 500 pounds. It is divided into 20 maunds. In Bombay there is a unit of capacity called the candy, equal to 8·2 imperial bushels.

CANDYTUFT (*Iberis*), a genus of plants of the natural order Cruciferæ, flowering in dense corymbs, and distinguished by an emarginate pouch with keeled and winged valves. It is indigenous to the countries bordering on the Mediterranean, and several species, as *Iberis umbellata*, *Iberis odorata*, and others, are cultivated in English gardens.

CANEPHORUS, one of the bearers of the baskets containing the implements of sacrifice in the processions of the Dionysia, Panathenæa, and other ancient Grecian festivals, an office of honour much coveted by the virgins of antiquity. The term is often applied to architectural figures bearing baskets on their head, and is sometimes improperly confounded with Caryatides.

CANICULA, the Dog-star or Sirius; hence *Canicular days*, the dog-days. See Dog-days, Sirius.

CANIDÆ, the dog family of animals, the chief genus being Canis, which includes the dog and wolf.

CANKER-WORM, a worm or larva destructive to trees or plants. In England the term has no specific application, but in America it is specifically applied to the larvæ of geometrid moths of the genus *Anisopteryx*. *A. pometaria*, the fall canker-worm, appears late in autumn. The wings of the male are brownish-gray in colour, the fore-wings having white streaks whilst the hind pair are marked by a black dot in the centre. The female is wingless, and deposits its eggs, which are shaped like flower-pots, in large numbers on the twigs of trees. *A. vernata*, the spring canker-worm, is similar in appearance and habits, but it comes out in the spring. Both are common throughout the United States.

CANNA, a genus of plants, of the order Marantaceæ, some species of which have fine flowers, and some, from their black, hard, heavy seeds, are called Indian shot. There are about thirty species in tropical America, with ornamental leaves, creeping rootstocks, and panicles of red or yellow flowers. *C. indica* is the best-known species, and *C. edulis* yields *Tous-les-mois.*

CANNABINACEÆ, the order of plants to which only two plants, hemp (genus *Cannabis*) and the hop (genus *Humulus*) belong, closely allied to the nettle order (Urticaceæ). It is often regarded as a tribe of the Urticaceæ. .

CANNANORE. See Cananore.

CANNING, Charles John, Earl, a son of the statesman George Canning, was born near London on Dec. 14th, 1812, and educated at Eton and Oxford. He entered parliament in 1836 as member for Warwick, and in the following year succeeded to the peerage, on his mother's death, as Viscount Canning. In 1841 he was appointed under-secretary of state for foreign affairs in Peel's government, and in 1846 commissioner of woods and forests. In the Aberdeen ministry of 1853, and under Palmerston in 1855, he held the postmaster-generalship, and in 1856 went out to India as governor-general, Throughout the mutiny he showed a fine coolness and clear-headedness, and though his carefully-pondered decisions were sometimes lacking in promptness, yet his admirable moderation did much to re-establish the British Empire in India. In 1858, when the government of India was transferred from the East India Company to the crown, Canning became the first viceroy; and in the succeeding year he was raised to the rank of earl. From that time till his retiral in March, 1862, the arduous task of undoing the mischief wrought by the mutiny devolved upon him, and his great success was a witness to his ability. He returned to England with shattered health, and died in London on June 17th, 1862.

CANNON-BALL TREE, *Couroupita guianensis*, a large tree of the order Lecythidaceæ, a native of Guiana, with a hard, woody, globular fruit 6 or 8 inches in diameter—whence the popular name of the tree. It has large white or rose-coloured flowers growing in clusters on the stem and branches. The pulp of the fruit is pleasant to eat when fresh.

CANROBERT, François Certain, French marshal, was born at Saint-Céré (Lot) on June 27th, 1809. He studied at the St. Cyr military school, and after distinguishing himself in Algeria was made captain in 1837. Later brilliant services in the same country earned him further promotion, and in 1850 he was brigadier-general. He took part in the *coup d'état* of 1851. He commanded in the Crimean war under St. Arnaud, and after his death received the chief command, but could not work in harmony with the British and made way for Pélissier. In the Italian war (1859) he commanded the third division, and distinguished himself at Magenta. In the Franco-German war he belonged to the force that was shut up in Metz and had to capitulate. He was latterly a French senator. He died on Jan. 28th, 1895.

CANSO, Gut or **Strait of**, a narrow strait or channel, about 17 miles long, separating Nova Scotia from Cape Breton Island. It is navigable by the largest ships, and its scenery is very beautiful.

CANTABRIAN MOUNTAINS, the general name of the various mountain ranges extending from the Western Pyrenees along the north coast of

Spain to Cape Finisterre. They attain in some parts a height of about 9000 feet, and are rich in minerals, especially copper, lead, iron, and gold. Large forests of oaks, chestnuts, and other trees are also found clothing their slopes.

CANTALOUPE, a small round variety of musk-melon, globular, ribbed, of pale-green or yellow colour and of delicate flavour; first grown in Europe at Cantalupo, in Italy.

CANTARO, a measure of weight and capacity. As a measure of weight it equals in Turkey 124·7 lbs., in Egypt 98 lbs., in Malta 175 lbs., &c. The Turkish cantar as a measure of capacity equals about 31·5 gallons. The Spanish wine measure cantaro is about 3½ gallons.

CANTERBURY-BELL, a name given to species of *Campanula*, especially *C. medium* and *C. trachelium*. See CAMPANULA.

CANTILEVER, CANTALIVER, a wooden or iron block framed into the wall of a house and projecting from it to carry mouldings, eaves, balconies, &c. The name is given also to a large projecting framework forming part of an iron bridge, directly carrying part of the roadway, and also supporting beams or girders bridging over a space between it and another similar structure. The Forth Bridge is the grandest example of a cantilever bridge. See FORTH BRIDGE.

CANTIRE. See CANTYRE.

CANTON, a town of the United States, capital of Stark county, Ohio, about 46 miles S.S.E. of Cleveland. Aided by the presence of natural gas, its industries have rapidly developed, including the manufacture of steel and steel goods, agricultural implements, carpets and woollen goods, bricks and tiles, &c. Pop. (1880), 12,258; (1890); 26,189.

CANVAS-BACK DUCK (*Fuligula* or *Nyroca vallisneria*), a bird peculiar to North America, and considered the finest of the water-fowl for the table. They arrive in the United States from their breeding-grounds in the north about the middle of October, sometimes assembling in immense numbers. The plumage is black, white, chestnut-brown, and slate colour; the average length about 20 inches.

CAPELIN, CAPLIN, CAPLAN, or KIBLING (*Mallotus villosus*), a small fish of the smelt family abundant on North American coasts, used as bait for cod and also as food. It is about 6 or 8 inches long, and closely related to the candle-fish.

CAPELLA, MARTIANUS MINEUS FELIX, a Latin writer of the fourth century. His extant work consists of nine books, the first two under the title De Nuptiis Philologiæ et Mercurii being an introductory allegory, whilst the others treat of Grammar, Logic, Metaphysics, Geometry, Arithmetic, Astronomy, and Music. His statement of the heliocentric system of astronomy in the eighth book may possibly have given hints to Copernicus, who quotes him occasionally.

CAPE TULIP. See BLOOD-FLOWER in SUPP.

CAPGRAVE, JOHN, English historian, was born at Lynn, Norfolk, in 1393. Most of his life was passed in the Augustinian friary of his native place, where he died in 1464. He was provincial of the order of Austin Friars in England, and was one of the most learned men of his day. He wrote in Latin numerous commentaries, sermons, and lives of the saints. His most important work was his Chronicle of England, in English, extending from the creation to the year 1417. Other works were a Liber de Illustribus Henricis and a Life of St. Katherine. Many of his works are lost, others have never yet been printed. His Chronicle and his Liber de Illustribus Henricis have been printed in the Rolls series.

CAPPAGH BROWN, a bituminous earth, coloured by oxide of manganese and iron, which yields pigments of various rich brown colours: called also *manganese brown*. It derives its name from Cappagh, near Cork, in Ireland.

CAPPARIDACEÆ, a natural order of dicotyledonous polypetalous plants, closely related to the Cruciferæ, mostly herbs and shrubs, having four petals and sepals, a great number of stamens, and an ovary elevated upon a long stalk. All of them appear to be more or less acrid. Some are very poisonous, others act as vesicatories, and a few are merely stimulant, as the *Capparis spinosa*, or caper-bush, the flower-buds of which constitute the capers of the shops.

CAPRAJA, a small volcanic island belonging to Italy, about 18 miles in circumference, situated between the north point of Corsica and the coast of Tuscany, about 55 miles S.W. of Leghorn. It is included in the province of Genoa. Its principal product is wine. Pop. 800.

CAPRIFOLIACEÆ, a natural order of monopetalous dicotyledons, closely related to the bedstraws (Rubiaceæ). It includes a number of erect or twining shrubs and herbaceous plants, comprising the honeysuckle (*Lonicera*), elder (*Sambucus*), guelder-rose, laurustinus, and wayfaring tree (*Viburnum Opulus*, *Tinus*, and *Lantana*), snowberry (*Symphoricarpus*), the *Linnæa borealis*, and, according to some, the tuberous moschatel (*Adoxa Moschatellina*). The characteristics of the order are opposite leaves without stipules, free anthers, epipetalous stamens, and fruit not splitting open when ripe. It is not an order of much economic importance.

CAPRIMULGIDÆ, the goat-suckers, a family of insessorial, fissirostral birds, nearly allied to the Hirundinidæ or swallow tribe. See GOATSUCKER.

CAPUT MORTUUM (Latin), literally, a dead head; a fanciful term much used by the old chemists to denote the residuum of chemicals when all their volatile matters had escaped; hence the word is figuratively used of anything from which all that rendered it valuable has been taken away.

CARABIDÆ, a very large family of carnivorous beetles, so named from the type-genus Carabus, usually large, adorned with brilliant metallic colours, and either wingless or having wings not adapted for flying.

CARACARA (from its hoarse cry), the popular name for *Polyborus Braziliensis* (the Brazilian caracara) and several other raptorial birds of the subfamily Polyborinæ, family Falconidæ. They are of considerable size, natives of South America, and are characterized by having the bill hooked at the tip only, the wings long, and the orbits, cheeks, and part of the throat more or less denuded of feathers.

CARAGEEN. See CARRAGEEN.

CARAMBOLA, the fruit of an East Indian tree of the same genus as the bilimbi, the *Averrhoa Carambola*, order Oxalidaceæ. It is of the size and shape of a duck's egg, of an agreeable acidulous flavour.

CARAPA, a small genus of tropical trees of the natural order Meliaceæ, with mostly imparipinnate leaves and regular flowers. A South American species, *C. guianensis*, is a fine large tree, whose bark is in repute as a febrifuge. Oil made from its seeds (called carap-oil or crab-oil) is used for lamps, and masts of ships are made from its trunk. The wood is called crab-wood. The oil of the African species, *C. tolucana*, called *coondi*, *kundah*, or *tallicoona* oil, is used by the negroes for making soap and anointing their bodies in order to protect them against insects. The oil of the South American carapa is used for the same purpose also.

CARBAZOTIC ACID. Same as Picric Acid (which see).

CARBIDE, formerly *carburet,* a compound of carbon with a metal or other element. Carbide of calcium is a carbide which has recently come into prominence, especially as the source of acetylene gas. It is made from lime and carbon (often in the form of coke) by the electric furnace, and chiefly with the aid of water-power. See Lime.

CARBINE. See Carabine.

CARBONDALE, an American city, state of Pennsylvania, about 110 miles N.N.W. of Philadelphia. It is the centre of a rich coalfield. Pop. (1891), 10,833.

CARBONEAR, a port in Newfoundland, on the eastern side of the peninsula separating Trinity Bay from Conception Bay, 25 miles in a north-west direction from St. Johns. Pop. (1891), 4127.

CARBON POINTS. See Electric Lighting.

CARBOY, a large and somewhat globular bottle of green glass protected by an outside covering of wickerwork or other material, for carrying vitriol or other corrosive liquid.

CARBURET, the old name for Carbide (which see above).

CARBURETTED HYDROGEN, the name given to two compounds of carbon and hydrogen, one known as *light carburetted hydrogen,* and the other as *ethylene, ethene,* or *olefiant gas.* The former is the compound CH_4 which occurs in coal-mines (fire-damp) and about the neighbourhood of stagnant pools. Mixed with from 7 to 14 volumes of atmospheric air it explodes. The latter is obtained from distilling coal or fat substances in close vessels. Its symbol is C_2H_4, and it explodes when mixed with 10 or 12 volumes of atmospheric air. See Damps.

CARCAJOU, a name for the American glutton or wolverene, also for a species of badger found in North America, *Meles labradorica.* See Badger.

CARCINOMA. See Cancer (disease).

CARD, an instrument for combing, opening, and breaking wool, flax, &c., freeing it from the coarser parts and from extraneous matter. It is made by inserting bent teeth of wire in a thick piece of leather, and nailing this to a piece of oblong board to which a handle is attached. But wool and cotton are now generally carded in mills by teeth fixed on a wheel moved by machinery. See Cotton-spinning, Woollen Manufacture.

CARDAMINE, a genus of plants of the natural order Cruciferæ, containing about sixty species with a very wide distribution. They are herbaceous plants with usually pinnate leaves, white or lilac flowers of the usual cruciferous type, and the siliquose fruit which characterizes a section of the order. The best-known British species is the cuckoo-flower, lady's-smock, or bread-and-milk (*C. pratensis*). *C. amara,* the bitter-cress, is not unlike the water-cress, but may be readily distinguished by its dark-coloured anthers.

CARDENAS, a seaport on the north coast of Cuba, 108 miles E. of Havana, with which it is connected by rail. It is one of the principal commercial centres of the island; the chief exports being sugar, molasses, and coffee. Pop. (1887), 23,354.

CARDIAC MEDICINES, medicines which act upon the heart. They may be roughly classified into those which stimulate the heart; *heart tonics,* which brace or tone the heart; and *heart sedatives* or *depressants,* which quiet or soothe the heart. To the first group belong ammonia, ether, camphor, and alcohol; to the second, digitalis, squills, lily of the valley, and strophanthus; and to the last group belongs aconite. Several of these must be administered with great care.

CARDINAL FLOWER, the name commonly given to *Lobelia cardinalis,* because of its large, very showy, and intensely red flowers. It is a native of North America, but is much cultivated in gardens in Britain.

CARDITIS, inflammation of the heart substance, a much less common disease than *pericarditis,* inflammation of the pericardium or lining membrane. See Pericarditis.

CARDONA, a town of Spain, in the province of Barcelona, on the right bank of the Cardoner, 50 miles N.N.W. of Barcelona, with a castle. In its vicinity is a hill of rock-salt 500 feet high, which affords inexhaustible supplies of salt. Pop. (1887), 3708.

CAREY, Henry Charles, American political economist, was born in Philadelphia on Dec. 15th, 1793, and died there on Oct. 13th, 1879. He was the eldest son of Matthew Carey, and in 1814 became a partner in his father's bookselling and publishing firm, where he continued until 1835. In that year he published an essay on the Rate of Wages, which he afterwards expanded into Principles of Political Economy (3 vols., 1837–40). His other important works are: The Credit System in France, Great Britain, and the United States (1838); The Past, the Present, and the Future (1848); The Principles of Social Science (3 vols., 1858–59); Letters on Political Economy (two series, 1860 and 1865); The Unity of Law (1872). Originally a free-trader, he became an advocate for protection on the ground of temporary expediency; held that the growth of population was self-regulating; and was opposed to the theories of Ricardo and others on the law of diminished returns from the soil and on rent. He was also opposed to any arrangement on the subject of international copyright. Some of his works have been translated into other languages, and his writings have had considerable influence on economical speculation.

CARIACOU, the Virginian deer (*Cervus—Cariacus—virginianus*), found in all parts of North America up to 43° N. lat. It is smaller than the common stag, and its colour varies with the season. In spring it is reddish-brown, in autumn slaty-blue, and in winter dull-brown.

CARINARIA, a genus of tænioglossate gasteropodous molluscs of the group Heteropoda, whose shells are known as Venus' slipper and glass nautilus. The gills are protected by a small and very delicate shell of glassy translucence. The creature itself is about 2 inches in length, and is of oceanic habits. It is so transparent that the vital functions may be watched by the aid of a microscope. The genus is the type of a family, Carinariidæ.

CARINATÆ (from L. *carina,* a keel), Huxley's second order of the class Aves or birds, the other two being Saururæ and Ratitæ. The Carinatæ include all the living flying birds, that is, all existing birds except the Cursores, and are characterized by the fact that the sternum or breast-bone is furnished with a prominent median ridge or keel, whence the name. See Ornithology.

CARLOVINGIANS, the second dynasty of the French or Frankish kings, which supplanted the Merovingians, deriving the name from Charles Martel or his grandson Charlemagne (that is, Karl or Charles the Great). Its origin is usually traced to Arnulph, a bishop of Metz, who died in 631. Charles Martel became mayor of the palace in 714 to the Merovingian *roi fainéant* Childeric, and in this office he was succeeded by his son Pepin le Bref, who in 752 deposed the merely nominal king and himself assumed that title. He was succeeded by Charlemagne and his brother Carloman (768–771).

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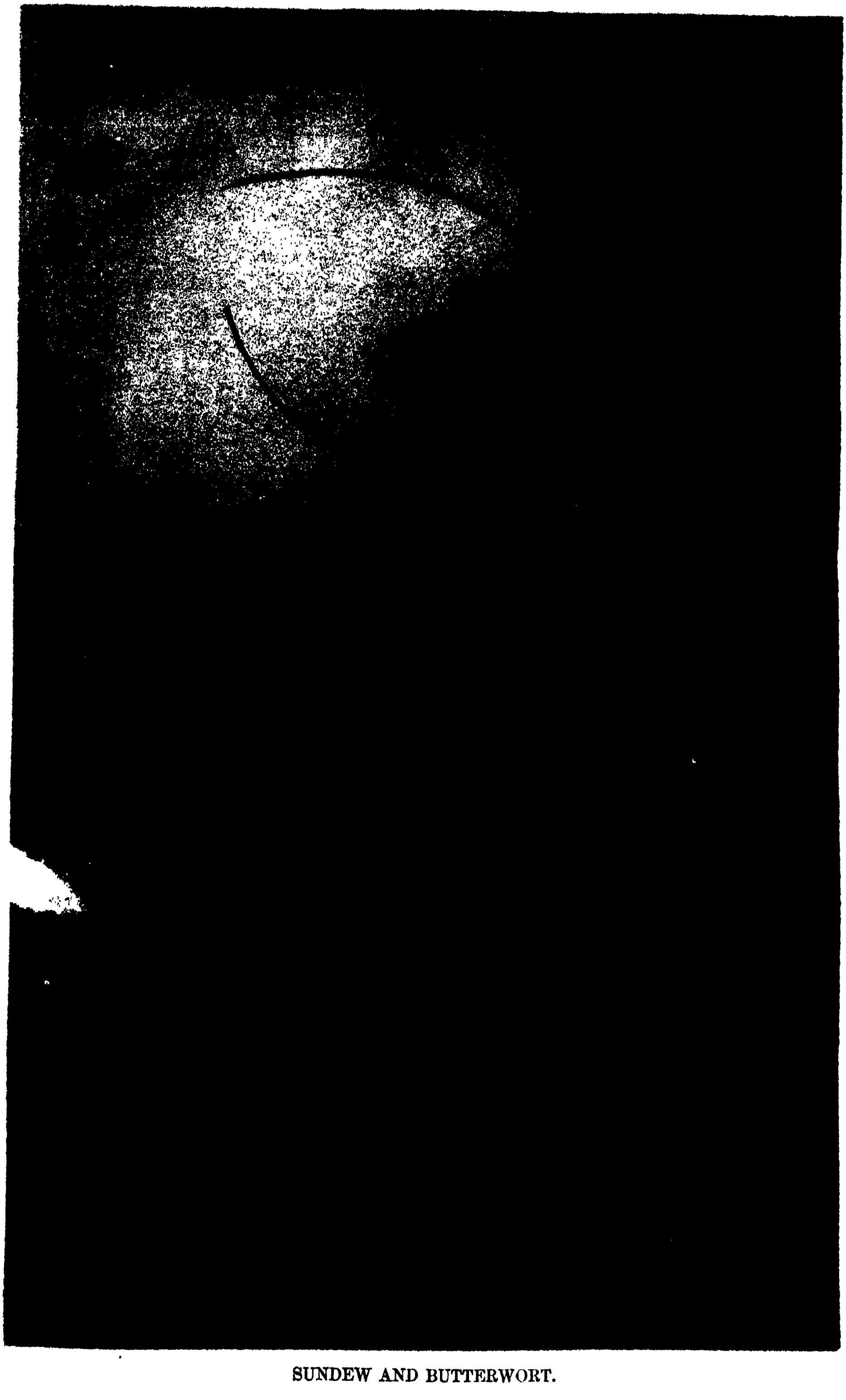

SUNDEW AND BUTTERWORT.

Charlemagne became sole king in 771, and extended greatly the dominions of the family. In 800 Leo III. crowned him emperor of the west. On his death in 814 he was succeeded by his son Louis le Débonnaire. He divided his empire among his sons, and at his death (840) his son Charles the Bald became King of France. He died in 877, and was succeeded by a number of feeble princes. The dynasty came to an end with Louis V., who died in 987. The house of Capet followed it.

CARNARIA. Same as CARNIVORA.

CARNAUBA, the Brazilian name of the palm *Copernica cerifera*, which has its leaves coated with waxy scales (whence the name *wax-palm*), yielding by boiling a useful wax. The fruit and pith are eaten, the leaves are variously employed, and the wood is used in building.

CARNIVOROUS PLANTS, plants which derive nourishment directly from the bodies of insects or other small creatures entrapped by them in various ways. Such plants, which number several hundreds, mostly belong to the natural orders Sarraceniaceæ or Pitcher-plants (genera Sarracenia, Darlingtonia, &c.), Droseraceæ (genera Drosera, Dionæa, Aldrovanda, &c.), Lentibulariaceæ (genera Pinguicula, Utricularia, &c.), and Nepenthaceæ (genus Nepenthes). In all these the apparatus for catching insects consists of a modified leaf or portion of a leaf, and in some the modifications are so curious and the adaptations so perfect that the plant seems almost endowed with intelligence. In the pitcher-plant order the leaf consists of a longer or shorter tube ventrally winged and sometimes crowned by a sort of hood. Insects are enticed to the leaves by means of a sugary secretion near the mouth, and sometimes also continued down the edge of the wing so as to form what has been described as a 'saccharine trail' from near the ground up to the orifice. The tube when not hooded may contain rain in addition to the internally secreted juice, but in the hooded forms rain is excluded. In Nepenthes the sessile leaf-blade is continued as a twining tendril which bears on its summit a pitcher closed in the younger plants by a hinged lid. The species of Drosera or Sun-dew, of which some are common in British bogs, have their leaves provided with stalked glands which exude a clear juice. When an insect alights on any of these glands, those in the neighbourhood bend towards it in order to secure it more effectively. In the allied *Dionæa muscipula* or Venus's Fly-trap of Carolina, however, the leaf-blade bears on its apex a sort of trap consisting of two pieces hinged together. These have bristles on their outer ends and a few sensitive hairs on their inner faces, and if any of the hairs or the hinge is touched by an insect the trap closes and secures it. The common Butterwort of Britain (*Pinguicula vulgaris*) also has leaves which catch insects (and vegetable matters) by means of sensitive glandular hairs, and the Bladderworts (Utricularia) are provided with small submerged ascidia or pitchers. The chief English work on this subject is Darwin's Insectivorous Plants (1875). Consult also Kerner's Natural History of Plants (Blackie & Son); and see DIONÆA, SUN-DEW, PITCHER-PLANT, &c.

CARNOT, MARIE FRANÇOIS SADI, grandson of the Carnot of the Revolution, was born at Limoges on Aug. 11th, 1837. He was educated at the École Polytechnique and became a civil engineer. In 1871 M. Gambetta appointed him Prefect of the Seine-Inférieure, and intrusted him with the duty of seeing to the defences of his department, a task which he fulfilled with great ability. M. Brisson gave him the portfolio of Public Works in his cabinet of 1885, and in the following year he became Minister of Finance, retaining this post under Brisson's successor, De Freycinet. In 1887 he was elected President of the French Republic in succession to M. Jules Grévy, but before his term of office had expired he was assassinated on June 24th, 1894, at Lyons, by an Italian named Caserio.

CAROLINA-PINK, MARYLAND PINKROOT, or **WORM-GRASS**, names given to the *Spigelia marylandica*, a North American plant of the order Loganiaceæ, bearing scarlet flowers, and having a root used as a vermifuge.

CAROLINGIAN. See CARLOVINGIAN in SUPP.

CAROLUS, a gold coin struck in the reign of Charles I., and originally 20*s.* in value, afterwards 23*s.*

CAROTID ARTERIES, the two great arteries which convey the blood from the aorta to the head and the brain. The *common carotids*, one on either side of the neck, divide each into an external and an internal branch. The *external carotid* passes up to the level of the angle of the lower jaw, where it ends in branches to the neck, face, and outer parts of the head. The *internal carotid* passes deeply into the neck, and through an opening in the skull behind the ear enters the brain, supplying it and the eye with blood. Wounds of the carotid trunks cause almost immediate death.

CAROUGE, a town of Switzerland, in the canton of Geneva, on the left bank of the Arve, near Geneva, with which it is connected by a bridge. It has machine-works, foundries, dyeworks, and manufactures of watches, &c. Pop. (1888), 5698.

CARPEL. See PISTIL.

CARPENTER, WILLIAM BENJAMIN, an English physiologist and naturalist, was born at Exeter on Oct. 29th, 1813. He was educated in his father's school at Bristol, and in 1833 entered University College, London, as a medical student. Two years later he went to Edinburgh University, where he graduated as M.D. in 1839; and in that year also he produced his first important work, The Principles of General and Comparative Physiology. In 1844 he was elected a Fellow of the Royal Society and also obtained the Fullerian professorship of physiology at the Royal Institution. From 1847 till 1852 he was editor of the British and Foreign Medico-Chirurgical Review, and in 1856 he was appointed registrar of the University of London, a post which he resigned in 1879. He died on Nov. 19th, 1885, from the effects of an accident. He wrote several well-known works on physiology, one of which has been already referred to. Others are: Principles of Mental Physiology (4th ed. 1876), and Principles of Human Physiology (1846, new edition by H. Power, 1881). Other works of his are: Introduction to the Study of the Foraminifera (1862, assisted by W. K. Parker and T. R. Jones); The Microscope and its Revelations (1868, 6th ed. 1881); The Physiology of Temperance and Total Abstinence (1853), besides many papers in scientific journals. He took a leading part in the expeditions sent out by government in 1868–70 for deep-sea exploration in the North Atlantic, and was chosen president of the British Association at Brighton in 1872.

CARPENTER-BEE, the common name of the different species of solitary bees of the genus *Xylocopa*. The species are numerous in Asia, Africa, and America, and one species (*X. violacea*) inhabits the south of Europe. They are generally of a dark violet-blue and of considerable size. They usually form their nests in pieces of half-rotten wood, cutting out various apartments for depositing their eggs. The common United States form is *X. virginica*.

CARPUS, in anatomy, the bones between the forearm and hand, the wrist in man, or corresponding part in other animals. See Hand.

CARRIAGE DOG. See Coach-dog in Supp.

CARROLL, Lewis. See Dodgson in Supp.

CARRON-OIL, a term for a liniment composed of linseed-oil and lime-water, so called from being much used in the case of burns at the Carron Iron-works.

CARSON CITY, a town of the United States, capital of the state of Nevada, in Ormsby county, picturesquely situated near the foot of the Sierra Nevada, 3 miles w. of Carson River and 15 s.w. of Virginia City. It was founded in 1858, and has mining, farming, and lumbering industries. There are hot springs in the neighbourhood. Pop. (1890), 3950.

CARTESIAN VORTICES. See Descartes.

CARTHAMIN, an astringent bitter principle obtained from the flowers of the *Carthamus tinctorius*, or safflower, a beautiful red pigment used in silk-dyeing. It is also called *Carthamic Acid*, and has the formula $C_{14}H_{16}O_7$.

CARTHAMUS. See Safflower.

CARTIER, Sir George Etienne, Canadian statesman, was born at St. Antoine, in Verchères county, Quebec, on Sept. 6th, 1814, and died in London on May 21st, 1873. Educated at the College of St. Sulpice, Montreal, he was admitted to the bar in 1835, took part in the rebellion of 1837, and had for a time to leave Canada. In 1848 he entered the Canadian parliament as representative of his native county, and in 1856 became provincial secretary. Later in the same year he became attorney-general for Lower Canada, in which post he was active in behalf of legal reforms. In 1857 he was a member of the Macdonald ministry, and in 1858 he himself became premier, remaining in this position, except for a few days, till 1862. In 1864 he declined the premiership, but accepted the office of attorney-general. He was active in bringing about the establishment of the Dominion of Canada in 1867, and held the office of minister of defence in the first Dominion cabinet. In 1868 he was created a baronet.

CARTIER, Jacques, a French navigator, was born at St. Malo in 1491, and died about 1557. After gaining some experience in fishing-fleets off the Labrador coast, he commanded an expedition to North America in 1534, entered the Straits of Belle Isle, and took possession of the mainland of Canada in the name of Francis I. Next year he sailed up the St. Lawrence as far as the present Montreal. In 1541 he went out as captain-general in command of a first detachment of ships to prepare the way for Roberval, who had been named viceroy. Finding, however, that his chief did not arrive, after he had waited some time, he returned to St. Malo. The natives usually received him well, but when about to return from his second voyage he treacherously kidnapped Donnaconna, one of the chiefs, and some others, in order to show them in his native country. He was living in France in 1552. His book, Discours du Voyage fait par le Capitaine Jacques Cartier aux Terres neufves de Canada, was published at Paris in 1598.

CARTWRIGHT, Thomas, one of the eminent Puritan divines of the 16th century, was born in Hertfordshire in 1535, and died at Warwick on Dec. 27th, 1603. He suffered imprisonment and exile more than once for his nonconformist opinions. He was a learned man, and at one time professor of divinity at Cambridge. His chief books are: A Second Admonition to the Parliament (the first one having been published in 1572); A Confutation of the Rhemist's Translation; Harmonia Evangelica; and a criticism of Hooker's Ecclesiastical Polity.

CARUPANO, a seaport of Venezuela, in the state of Bermudez, on the north coast of the peninsula of Paria. It has some manufactures and a considerable trade. Pop. about 10,000.

CARUS, Julius Victor, German zoologist, was born at Leipzig on Aug. 25th, 1823. After studying at Leipzig, Würzburg, and Freiburg, he became at the age of twenty-six keeper of the Oxford museum of comparative anatomy. In 1853, two years after his return to his native city, he was appointed professor of comparative anatomy and director of the Zoological Institute there. He again visited Britain in 1873 to lecture on zoology at Edinburgh in place of Professor Wyville Thomson, who was chosen to serve on the *Challenger* expedition. Amongst his numerous writings are System der Tierischen Morphologie (1853); Handbuch der Zoologie; and Geschichte der Zoologie. He has translated most of Darwin's works into German.

CARUS, Karl Gustav, German physician and physiologist, was born at Leipzig on Jan. 3rd, 1789, and died at Dresden on July 28th, 1869. He became professor of midwifery at the Medical Academy, and then royal physician, being latterly a privy-councillor. He published a great number of writings covering a wide field of science, including medicine, physiology, anatomy, psychology, physics, painting, besides memoirs of his life. Of these his System der Physiologie (1838–40), and Lebenserinnerungen und Denkwürdigkeiten (4 vols., 1865–66), may be mentioned.

CARY, Lucius, See Falkland.

CARYOCAR, a genus of plants belonging to the natural order Ternstrœmiaceæ, consisting of lofty trees, natives of tropical America, which produce good timber. They have evergreen, ternate or pinnate leaves, and flowers in racemes. *C. nuciferum*, a species abundant in British Guiana, yields the kidney-shaped *souari* or *butter-nuts*. Other species are *C. glabrum* and *C. amygdaliferum*.

CARYOTA, a genus of palms, with doubly-pinnate leaves, the best-known species of which (*C. urens*) is a native of most of tropical Asia; it supplies an inferior kind of sago, and from its juice is made toddy or palm-wine. The leaf-stalks yield *kittul fibre*, which is used in making baskets, brooms, &c.

CASAREEP. See Cassareep in Supp.

CASSAGNAC, Adolphe Bernard Granier de, a French journalist and politician, was born in 1806, and died on Jan. 31st, 1880. He began his career at Paris as contributor of literary criticisms to the Journal des Débats, and soon made himself known, and latterly notorious, as editor of various papers, the Globe, the Pouvoir, the Pays, &c., and as being involved in many controversies and duels. He published various books, chiefly historical. Amongst the principal are: Portraits Littéraires; Histoire des Causes de la Révolution Française; Histoire des Girondins; L'Empereur et la Démocratie moderne.—His son, Paul-Adolphe Marie Prosper Granier de Cassagnac, born at Paris on Dec. 2nd, 1842, has had a career and a reputation not dissimilar to those of his father. He was taken prisoner at Sedan in 1871, and underwent eight months' confinement in Silesia. His violent advocacy of Bonapartism has led him into innumerable duels, and he has on several occasions been summoned for libellous articles in the Pays and other newspapers. He was a vigorous supporter of General Boulanger, but his violence has of recent years somewhat abated. Since 1884 he has edited a journal known as L'Autorité. He has written a Histoire de la troisième République (1875).

CASSAREEP, Cassireep, the concentrated juice of the roots of the common or bitter cassava (*Manihot utilissima*; see Cassava), flavoured by aromatics and deprived of its poisonous properties by boiling. It is used to give a relish to soups and other dishes, and forms the basis of the West Indian 'pepper-pot'. It is a powerful antiseptic, and is very useful in keeping meat fresh in a tropical climate.

CASSITERITE (Gr. *kassiteros*, tin), an ore of tin widely distributed, and the one from which most of the metal is obtained. It is a peroxide (SnO_2), and consists approximately of tin 79, oxygen 21.

CASSIUS, Purple of. See Purple of Cassius.

CASTANEA. See Chestnut.

CASTELAR, Emilio, a Spanish politician and author, was born at Cadiz on Sept. 8th, 1832, and studied in Madrid University. In 1856 he was made professor of history in the University of Madrid, but becoming involved in the republican disturbances of 1866, he had to take refuge in Switzerland. Having gone back to Spain in 1868 he was returned to the Cortes in the following year. In 1873 he was elected president of the republican Cortes, but resigned in Jan. 1874, in consequence of a vote of confidence being defeated. After the pronunciamiento in favour of Alphonso XII., Dec. 13th, 1874, Castelar retired from Spain, but in a year or two he returned. In 1893 he definitely retired from political life. He has published many novels, poems, and political works, amongst which may be mentioned Ernesto (1855); Legendas Populares (1857); Ideas Democráticas (1858); Roma vieja y nueva Italia (tr. into English, 1873); Vida de Lord Byron; Tragedias de la Historia (1883); and Recuerdos de Italia (1884).

CASTLEFORD, a thriving manufacturing town of England in the West Riding of Yorkshire, on the Aire, here crossed by a bridge, 10 miles s.e. from Leeds. The public buildings include the church of All Saints, several denominational chapels, schools, a market-hall, mechanic's institute, &c. There are numerous collieries in the neighbourhood; and the town has extensive manufactures of glass bottles, earthenware, and chemicals. Pop. (1881), 10,530; (1891), 14,143; (1901), 17,382.

CASTLETOWN, a small town and seaport near the southern extremity of the Isle of Man, situated on a bay of the same name, at the mouth of the Silverburn, about 10 miles to the south-west of Douglas. It was long the capital of the island. In the centre is Castle Rushen, dating from the sixth century, but rebuilt in the tenth by Norsemen. It has latterly been much extended, and is now partly used as a prison and public offices. Pop. (1891), 2178.

CASTOR, Castoreum, a reddish-brown substance, of a strong penetrating smell, secreted by two glandular sacs connected with the organs of reproduction of the beaver, and used by perfumers.

CASTORIDÆ, a family of rodent animals comprising the beaver, &c.

CASUARINA, or Botany-bay Oak, the single genus of the natural order of Casuarinaceæ, or cassowary-trees. There are about thirty species, natives chiefly of Australia. They are jointed leafless trees or shrubs, nearly related to the birches, having their male one-stamened flowers in whorled catkins and their fruits in indurated cones. Some of them produce timber called *beefwood* from its colour. *C. quadrivalvis* is called the she-oak, *C. equisetifolia* the swamp-oak.

CASUS BELLI, the material grounds which justify (or are alleged by one of the parties concerned to justify) a declaration of war. The *casus belli* is not seldom a very trifling one, and does not necessarily indicate the real *causa belli* or cause of the war.

CATABOLISM. See Metabolism in Supp.

CATACLYSM, in geology, a physical catastrophe of great extent, supposed to have occurred at different periods, and to have been the efficient cause of various phenomena observed in the surface configuration of localities. The belief in cataclysmic movements as geological agents has largely given place to that in the working of ordinary agencies over long periods of time.

CATALAN, a native of Catalonia, or North-eastern Spain, or the language of Catalonia, which holds a position similar to the Provençal, having been early cultivated and boasting a considerable literature. It was established as a literary language by the close of the thirteenth century, and is still to some extent used as such in its own region.

CATALAUNIAN PLAIN, the wide plain around Châlons-sur-Marne, famous as the field where Aëtius, the Roman general, and Theodoric, king of the West Goths, gained a complete victory over Attila, 451 A.D.

CATALPA, a genus of plants of the natural order Bignoniaceæ, having six known species in China, Japan, North America, and the West Indies. The species are trees or shrubs with broad simple cordate or ovate leaves and large, gay, trumpet-shaped flowers, having a two-lipped corolla and five stamens, of which only two are fertile. *C. syringifolia*, a North American species, is well adapted for large shrubberies, and has been introduced into England and other parts of Europe. *C. longissima* contains much tannin in its bark, and is known in the West Indies by the name of French oak.

CATALYSIS. See Contact Action.

CATCHFLY, a popular name of several plants of the genus *Silene* (which see). *Dionæa muscipula*, of the sun-dew order, and *Lychnis Viscaria*, closely related to *Silene*, are also so called.

CAT-FISH, a remarkably voracious fish, the *Anarrhichas lupus*, belonging to the family of gobies, known also as the *Wolf-fish* or *Sea-wolf* (which see). The same name is also common to several North American fish of the genus *Pimelodus*. *P. catus* (the common cat-fish) is known also as the *Horned Pout* and *Bull-head*. It is excellent eating.

CATHA, a genus of plants belonging to the natural order Celastraceæ, mostly natives of Africa. The leaves and twigs of *C. edulis*, an Arabian shrub with elliptical leaves, sometimes opposite and sometimes alternate, and small, white flowers, known as *khat* or *cafta*, possess properties akin to those of tea and coffee, and the plant is much cultivated by the Arabs. The use of khat is of greater antiquity than that of coffee.

CATHARTICS. See Purgatives.

CATHAY, an old name of China.

CATHETOMETER, an instrument for measuring small differences of level between two points; in its simplest form, a vertical graduated rod, upon which slides a horizontal telescope. With the telescope the observer sights the two objects under examination, and the distance on the graduated rod moved over by the telescope is the measure of the distance of height between the two objects.

CATHODE. See Anode in Supp. and Electrode.

CATKIN, the name given to a spicate inflorescence in which the flowers are either all male or all female and apetalous. Many of our common trees, such as the oak, willows, &c., have their flowers in catkins. It is also called an *amentum*. See Botany.

CATLIN, George, a writer on the American Indians, was born in Wilkesbarre, Pennsylvania, in 1796, and died in Jersey city, N. J., on Dec. 23rd, 1872. After practising as a lawyer for two years he set up at Philadelphia as a portrait-painter, and in 1832 commenced special studies of the American Indians, residing many years amongst them both in North and South America. In 1840 he came to Europe, and subsequently introduced three parties of American Indians to European courts. His finely-illustrated works are: Manners, Customs, and Condition of the North American Indians (1857); North American Portfolio (1844); Eight Years' Travel in Europe (1848); Last Rambles amongst the Indians, &c. (1868).

CATMINT, or Catnip (*Nepeta Cataria*), a plant of the natural order Labiatæ, not uncommon in England, scarce in Scotland and Ireland, and widely diffused throughout Europe, North America, &c. It grows erect to a height of 2 or 3 feet, has whorls of rose-tinged, whitish flowers, and stalked, downy, heart-shaped leaves. It has much the same fascination for cats as valerian root.

CAT'S-TAIL, a plant. See Reed-mace in Supp.

CAT'S-TAIL GRASS. See Timothy Grass.

CATTLE PLAGUE. See Rinderpest.

CATTY, a standard of weight in China and the Malayan Archipelago. In China, the Straits Settlements, Java, British North Borneo, &c., it is approximately 1⅓ lb. The Siamese catty, or chang, is equal to 2·675 lbs.

CAUCA, a river of South America, in Colombia, an important tributary of the Magdalena; length, 600–700 miles. Its course is mainly northerly, and it forms many waterfalls. It gives its name to the largest department or state of Colombia, stretching along the west coast. The capital is Popayan, on the river Cauca. The area is about 257,462 square miles; pop. (1881), 621,000.

CAUDEBEC-EN-CAUX, a picturesque little French town in the department of Seine-Inférieure, on the right bank of the Seine, 30 miles E. of Havre. It has a fine Gothic church of the fifteenth century. Pop. (1896), 2433.

CAUDEBEC-LES-ELBEUF, a manufacturing town of France, in the department of Seine-Inférieure, a suburb of Elbeuf. Pop. (1896), 10,273.

CAUDEX, in botany, the stem of a tree, more especially applied to the scaly trunk of palms and tree-ferns. It often appears as a rhizome running along the surface of the earth or underground, as in many ferns.

CAUL, a popular name for a membrane investing the viscera, such as the peritoneum or part of it, or the pericardium; also a portion of the amnion or membrane enveloping the fetus, sometimes encompassing the head of a child when born. This caul was supposed to predict great prosperity to the person born with it, and to be an infallible preservative against drowning, as well as to convey the gift of eloquence. During the eighteenth century seamen often gave from £10 to £30 for a caul.

CAUTERETS, a celebrated bathing locality in France, in the department of Hautes-Pyrenees, about 28 miles S.S.W. of Tarbes. There are a large number of mineral springs which contain much sulphur, and have a temperature of 102° F.

CAVEAT (Latin, 'let him beware'), in law, a process in court to stop proceedings, as to prevent the enrolment of a decree in chancery in order to gain time to present a petition of appeal to the lord-chancellor. In the United States this name is given to a notice lodged in the patent-office by a person who wishes to patent an invention, but desires to be protected till he has perfected it. It stands good for a year.

CAVE-MEN, a name for certain prehistoric races who lived in such European caves as those mentioned in article Cave, and of whom very little is known. That they were in a low state of civilization, though possessed of some artistic faculty (spirited drawings of animals on reindeer horn, &c., being extant), is evidenced by the fact that they were ignorant of the metals, of pottery, and of agriculture, and had no domestic animals. Their chief food seems to have been the reindeer, and their manner of life was probably somewhat similar to that of the Esquimaux.

CAVE-TEMPLE, a cave used as a temple; but the name is especially applied to temples excavated in the solid rock, such as exist in considerable numbers in India. See Elephanta, Ellora, Architecture.

CAVICORNIA. See Ruminants.

CAVY, the popular name for a genus of rodent animals (*Cavia*) belonging to the family Cavidæ characterized by molars without roots, fore-feet with five toes, hinder with three, and the absence of a tail and clavicles. They are natives of tropical America, the most familiar example of this genus being the guinea-pig (which see).

CAYLEY, Arthur, mathematician, was born at Richmond on Aug. 16th, 1821. He received his early education at Blackheath and King's College, London, passing subsequently to Trinity College, Cambridge, where in 1842 he graduated as Senior Wrangler and first Smith's prizeman. Called to the bar in 1849, he practised for some years as a conveyancer, but in 1863 he was appointed first Sadlerian professor of pure mathematics at Cambridge. Trinity College in 1875 accorded him the rare honour of electing him a Foundation Fellow. He received many distinctions from universities and learned societies both at home and abroad, and in 1883 he presided over the meeting of the British Association at Southport. On Jan. 26th, 1895, he died at Cambridge. Dr. Cayley seldom identified himself with movements outside his own immediate work, but he took a prominent part in the agitation for the higher education of women which resulted in the foundation of Newnham College. As a mathematician he was characterized by the wide scope and originality of his work. His chief memoirs deal with differential equations, elliptic functions, and determinants. His Elementary Treatise on Elliptic Functions appeared in 1876, and Single and Double Theta-functions in 1881; and in 1889 a collected edition of his papers began to be issued, extending over a number of volumes.

CAYUGA LAKE, a lake in the State of New York, on the boundary of Cayuga and Seneca counties, and extending south into Tompkins county, 38 miles long and from 1 to 3½ miles wide. It is much frequented by pleasure parties. The town of Ithaca stands at the southern extremity of the lake.

CEBADILLA. See Sabadilla.

CEBU, or Zebu, one of the Philippine Islands, situated between Bohol and Negros, separated from the latter by a channel which varies from 5 to 15 miles in width. It is a long, narrow island, 130 miles in length, with an extreme width of 20 miles. Its area is 2275 square miles. Gold, silver, lead, and coal are plentifully found. Sugar cultivation and the manufacture of abaca are the chief industries. Pop. 518,000.—The town of Cebu, on the eastern coast of the island, the oldest Spanish settlement on the Philippines, is a place of considerable trade, and has a cathedral and several churches. It was close to the site of this town that Magellan was killed on April 27th, 1521.

CEBUS, a genus of monkeys. See Capuchin Monkey and Sapajou.

CECIDOMYIA, the genus of dipterous insects to which the Hessian fly (*C. destructor*) belongs.

CECROPIA MOTH (*Platysamta cecropia*), the largest moth of the United States, often measuring over 6 inches from wing-tip to wing-tip. It belongs to the silk-worm family (Bombycidæ), and its caterpillar spins a large cocoon from which a coarse silk may be prepared. The moth is of a grayish colour, with white, black, and other markings; and the larva is green with bristles and yellow and red marks.

CEDAR-BIRD, a name given to the American wax-wing (*Ampelis cedrorum* or *Bombycilla carolinensis*), from its fondness for the berries of *Juniperus Virginiana*, a plant often known as cedar. It is a handsome and sprightly bird of a brownish colour, occurring throughout the whole of the United States, but it has no song.

CEDAR CREEK, a stream of the United States, rising in Shenandoah county, Virginia, and flowing into the North Fork of the Shenandoah river. It was near this creek that General Sheridan converted a defeat of the Federals by the Confederates into a complete victory, on Oct. 19th, 1864.

CEDAR OIL, an aromatic oil obtained from the American red cedar (*Juniperus virginiana*). It is used for scenting soaps.

CEDAR RAPIDS, a city of the United States, in Linn county, Ohio, between Des Moines and Dubuque, 219 miles w. of Chicago, and on the Cedar River, whose falls afford water-power for the industries of the place. It is an important railway centre, and has large flour-mills, breweries, machine-works, &c., and a flourishing trade. Pork-packing is also an important industry of the place. It was founded in 1849. Pop. in 1890, 18,020.

CEDRELA, a genus of large timber trees, natives of the tropics of both hemispheres, giving name to the order Cedrelaceæ, which is now usually included in Meliaceæ. The species have evergreen, equally pinnate leaves, and small bell-shaped white flowers. *C. odorata* of Honduras and the West Indies yields bastard cedar; *C. australis* is a valuable Australian timber tree; one or two East Indian species have febrifugal properties.

CEDRELACEÆ, the mahogany family, a natural order of dicotyledonous plants, nearly allied to, if really separate from, the Meliaceæ. They are trees with alternate pinnate leaves and a woody capsular fruit. Different species yield mahogany, satin-wood, yellow-wood, &c. The typical genus is *Cedrela* (see above).

CEDRUS. See CEDAR.

CELANDINE, a name given to two British plants, the greater celandine and the lesser celandine; also called *swallow-worts*, because the plants were believed to flower when the swallow arrived, and to die when it departed. The former is *Chelidonium majus*, and the latter *Ficaria ranunculoides* or *Ranunculus Ficaria*. This latter, belonging to the order Ranunculaceæ, is a favourite wild-flower from its being one of the earliest British plants to come into blossom, having petals of a fine golden-yellow colour, arranged so as to form a sort of star. Wordsworth's two poems on the small or lesser celandine are well known. Its root consists of small fleshy tubers. It is often called pilewort, being a reputed cure of piles. The greater celandine belongs to the poppy family; it is a glaucous hairy annual with small yellow flowers, and is full of a yellow juice of a poisonous acrid nature.

CELANO, LAKE OF. See FUCINO.

CELASTRACEÆ, an order of polypetalous dicotyledons, consisting of shrubs and small trees, natives of Southern Europe, Asia, America, Australia, &c., most of them of no great importance. They have generally acrid properties. The chief genera are *Celastrus*, *Euonymus*, and *Elæodendron*. The only British species is the spindle-tree (*Euonymus europæus*). See SPINDLE-TREE.

CELERIAC, turnip-rooted celery, a variety of celery in which the root resembles a turnip and may weigh 3 or 4 lbs. It is much cultivated on the continent of Europe, less so in Britain, and is eaten either in salads or cooked.

CELERY-FLY (*Tephritis Onopordinis*), a two-winged fly, the larvæ of which are destructive to celery and parsnip.

CELLULAR TISSUE, in animal physiology, a name for a sort of connective tissue which is also called *areolar tissue*. It is made up of bundles of white fibrous tissue interlacing and crossing to form a mesh-work. Numerous elastic fibres are present, conferring elasticity. The two kinds of fibres are easily distinguished, under the microscope, by adding dilute acetic acid, when the white fibres swell up and become transparent, and the unaffected yellow elastic fibres are revealed. The interlacing bundles inclose little spaces or areolæ, whence one name of the tissue. It is a tissue found in large quantities under the skin, covering the muscles, the blood-vessels, and nerves, and in various parts forming a kind of protective covering for delicate and important organs.—In botany, the term is applied to the soft substance of plants, composed of elementary vesicles or cells without woody or vascular tissues.

CELTIS, a genus of trees of the natural order Urticaceæ, closely related to the elm. *C. australis* is the nettle-tree. See NETTLE-TREE.

CEMBRA PINE (*Pinus Cembra*), a fine conifer of Central Europe and Siberia, having edible seeds and yielding a turpentine called Carpathian balsam. *Swiss stone pine* and *Siberian pine* are also names given to it. See PINE.

CENTAVO, a Chilian coin similar to the cent (which see).

CENTESIMO, a coin of Italy, Peru, &c., similar to the cent (which see).

CENTRAL AFRICA PROTECTORATE, BRITISH, a British possession in South Africa, situated mainly on the west of Lake Nyassa. The eastern boundary, proceeding from the eastern shore of Lake Nyassa near its foot, passes down the east side of Lake Shirwa and along the Rivers Ruo and Shiré, the former being a tributary of the latter. The confluence of the Shiré with the Zambesi is, however, in Portuguese territory. Proceeding northwards from the most southerly point of the protectorate, the western frontier is partly formed by the Mang-anja Range and other mountains till Mount Kalundi is reached; from that point it runs irregularly north to the Sonawe river, which flows into Lake Nyassa. Thus the protectorate comprises great part of the Shiré basin to the south of the lake, and is bounded partly by Portuguese East Africa, partly by Northern Zambesia or Rhodesia, and partly by German East Africa. It was formally constituted a protectorate administered by a commissioner under the Foreign Office on May 14th, 1891. The total area is 42,217 square miles, divided into twelve districts, and the population in 1897 included 350 Europeans (mostly in the south), 263 Indians, and 844,995 natives. The greater part of this region, especially the southern portion, is mountainous, and some of the peaks attain a considerable height. The minerals will probably prove to be of commercial importance. The commissioner resides at Zomba, a town about half-way between the Shiré and Lake Shirwa, but the chief centre of population is Blantyre, situated farther south and at an altitude of over 3000 feet. Other towns are Katunga's, Chiromo, and Port Herald on the lower Shiré, Mpondas and Fort Johnston on the Shiré near Nyassa, Livingstonia, Bandawe, Kotakota, and

Karonga on the shore of the lake. The settlements are being rapidly improved by the substitution of good brick and stone houses for the former buildings of wattle and daub. The climate, especially in the Shiré highlands, is healthier than in most of tropical Africa, the only serious complaint being 'blackwater' fever. The first three months of the year are the most unhealthy. Coffee, rice, wheat, oats, barley, &c., are cultivated with success. Cedars, mangos, peaches, and other plants are being steadily introduced. There is a considerable trade carried on mainly along the lake and down the rivers Shiré and Zambesi to Chinde on the coast, where the ocean-going steamers call. The chief imports are cotton goods, machinery, provisions, hardware, and agricultural implements; and the exports comprise ivory, rubber, tobacco, oil-seeds, and coffee. The imports in 1898-99 were valued at nearly £100,000, of which nearly 94 per cent went through Chiromo. The exports for that year amounted to about £38,000. The military force consists of Sikhs from India and native troops under British officers, and there are some gunboats on the rivers and the lake. Telegraphic communication is being opened up, and already Blantyre, Zomba, and Fort Johnston are connected with Cape Town and Salisbury. A railway from Chiromo, at the head of the Shiré navigation, into the heart of the protectorate is projected.

CENTRAL HEAT. See Earth.

CENTRAL INDIA AGENCY, a collection of states in Hindustan, consisting of four groups or agencies, viz. Bundelkhand, Bhaghelkhand, Gwalior, and Nimar and Malwa, under the ultimate charge of the governor-general's agent at Indore. The largest individual states are Gwalior, Indore, and Bhopal. These states cover an area of 77,808 square miles, and have a pop. of 10,318,812.

CENTRE-BOARD, a broad, quadrilateral piece, movable round a pivot in a slot in the bottom of a vessel, and forming a sort of movable keel. It is used especially in American yachts, and is raised and lowered in a well extending longitudinally amidships. It tends to prevent leeway and gives the vessel greater stability when under a press of canvas.

CENTRIFUGAL MACHINES, a name given to machines used for various purposes, in which centrifugal force produced by rapid revolution is utilized. Such a machine may be used for drying clothes or other goods, for instance, the articles being placed in the inside of a hollow cylinder, which is made of wire-gauze or has numerous perforations in its circumference, and is driven at a high speed, the moisture being thus caused to fly off by centrifugal action. Sugar is now often separated from the molasses by a centrifugal machine, the sugar in this case being commonly known by the trade name of 'centrifugal sugar'. The cylinder in which the sugar is contained is placed within a larger cylinder in which the molasses is received. Liquids such as beer, for instance, can also be clarified and cleared of foreign substances by means of centrifugal action, the extraneous matters being made to collect at the circumference of the vessel through the high rate of speed at which it is driven, while the clear liquid can be drawn off by an outlet at the centre. Cream is now commonly separated from milk in large dairies by the same method. (See Dairy.) The name *centrifuge* is now used as synonymous.

CENTURIPE (anc. *Centuripa*), also called *Centorbi*, a town of Sicily, in the province of Catania, on a height above the valley of the Simeto, 20 miles N.W. of Catania. It is situated in a fertile district yielding soda, sulphur, and marble. The ancient city, of which considerable remains exist, was at one time among the most flourishing of Sicily. Pop. 9000.

CENTURY-PLANT, a popular name of the *Agave americana*, or American aloe. See Agave.

CEPHAËLIS, a genus of plants belonging to the order Rubiaceæ, natives of tropical America. See Ipecacuanha.

CEPHALASPIS (Greek, *kephalē*, the head, and *aspis*, a shield), a genus of fossil ganoid fishes occurring in the Old Red Sandstone, belonging to the same order as the bony-pike and sturgeon. They have longish bodies; the head is large and crescent-shaped, bearing a close resemblance to the shape of a saddler's knife, and is protected by a large buckler-shaped plate which is prolonged into a point on either side. No jaws or teeth are known, and the mouth was probably adapted for suction.

CERASTES (Greek, from *keras*, a horn), a genus of African vipers, remarkable for their fatal venom, and for two little horns formed by the scales above the eyes. Hence they have received the name of horned vipers. The tail is very distinct from the body. *C. vulgaris* is the horned viper of Northern Africa, a species known to the ancients. There are several other species.

CERASUS, the cherry genus of trees, of the order Rosaceæ, now always regarded as a section of the genus Prunus, distinguished from the other sections by the smooth, bloomless fruit, conduplicate vernation, and other characters.

CERATODUS, a genus of fishes belonging to the Dipnoi or lung-fishes. *C. Forsteri* is the barramunda or native salmon of the Australian rivers. It measures from 3 to 6 feet in length, and forms an interesting connecting-link between the oldest surviving group of fishes and the lowest air-breathing animals. Its air-bladder serves as a lung, and although it breathes chiefly by the gills, it also inhales air directly. It is said to leave the water and go on the flats after vegetable food—on which it seems chiefly to live—but its travelling powers cannot be great, and some authorities deny them altogether. It is said to bury itself in the mud during the dry season, but this also is denied.

CERDIC, king of the West Saxons, invaded England about the end of the fifth century, and after gradually fighting his way and extending his conquests, established the kingdom of Wessex about 519. He suffered a severe defeat from the Britons in 520 at Mount Badon, or Badbury, in Dorsetshire. In 530 he conquered the Isle of Wight. At his death in 534 his kingdom extended over the present counties of Berks, Wilts, Dorset, and Hants (including the Isle of Wight).

CEREOPSIS, a genus of birds allied to the geese, the only species being *C. Novæ Hollandiæ*, called New Holland or Australian goose. The bill is very short, with a greenish-yellow wax-like covering at the base, the neck is short and thick, the head small, the legs long, and the body somewhat massive. Its general colour is gray, with some brown patches; and it has a heavy flight and swims slowly. New Holland geese are gradually disappearing.

CEROXYLON, a genus of South American palms. See Wax-palm.

CERTHIA, a genus of insessorial birds, type of the family Certhiadæ or Creepers. See *Creepers*.

CERVETRI, or Cervetteri, a small place in Italy, 27 miles W. of Rome, where formerly stood the ancient Etruscan city of Cære. It has yielded many artistic and other objects of Etruscan manufacture. Pop. 930.

CERVUS, the genus of animals to which the stag belongs, forming the type of the deer family, Cervidæ. See Deer.

CESTOIDEA, CESTODA, CESTOID WORMS, one of the three classes of Platyhelminthes (flat-worms), consisting of elongated and usually segmented forms without a mouth or alimentary canal, and possessed of organs of attachment at the anterior end. The segments are known as *proglottides* and are to some extent distinct animals. See TAPE-WORM.

CESTRACION, a genus of cartilaginous fishes allied to the sharks, of which the best-known species is the Port Jackson shark of Australia (*C. Philippi*). Four species are known, varying in length from 4 to 5 feet. They feed mainly on various kinds of molluscs. The family Cestracionidæ, though now poorly represented, was very abundant in the earlier geological periods.

CETERACH, a genus of ferns of the order Polypodiaceæ, chiefly known by the reticulated veins, the simple sori with scarcely any indusium, and the abundance of chaffy scales which clothe the under surface of the leaf. The only species, *C. officinarum* (the scale-fern or miltwaste) is indigenous to Britain, and common on rocks and walls. It had formerly a great reputation as a remedy in ailments of the spleen and liver.

CETEWAYO, a Kaffir chief or king, son of Panda, king of the Zulus. Disturbances as to the succession having arisen in Zululand, Mr. (afterwards Sir) Theophilus Shepstone, representative of the Natal government, secured the recognition of Cetewayo as king in 1873. The latter, however, in spite of the obligations into which he had entered, proved a tyrannical ruler, and maintained a large army. A dispute which had arisen regarding lands on the frontier was settled by arbitration in favour of the Zulus; but on the refusal of Cetewayo to comply with the conditions imposed, war was declared against him by the British, and the king made prisoner soon after the battle of Ulundi (July, 1879). In 1882 he visited England and was conditionally restored to part of his dominions. In the following year he was driven from power by the chief Usibepu, and remained under the protection of the British until his death at Ekowe on Feb. 8th, 1884.

CETINJE. See CETTIGNÉ.

CETIOSAURUS, CETEOSAURUS, the whale-lizard, a genus of fossil saurians, the most gigantic of the order Deinosauria. The articulations of the bones of the limbs, the possession of long claws, and the hollowness of the bones indicate that it was a terrestrial animal, probably an inhabitant of marshes or river-sides. Its remains are found in the Oolite and Wealden formations.

CEVADILLA. See SABADILLA.

CHACMA. See BABOON.

CHAD. See TCHAD.

CHAFER, a term loosely applied to certain insects of the beetle order, especially such as themselves or their larvæ are injurious to plants. See COCKCHAFER.

CHAIN-PUMP, a pump consisting in principle of an endless chain equipped with a number of valves or buckets moving round two wheels one above and one below. The chain in its ascent passes through a tube closely fitting the valves or buckets, the water being discharged either from the top of the tube or from an orifice in it.

CHAINS are mechanical contrivances consisting of a string of more or less circular or oval links, each of which is threaded through the adjacent ones or otherwise connected with them. The use of chains as symbols of authority and for personal adornment is of considerable antiquity, but their important uses in dragging, supporting, connecting, &c., are comparatively or altogether modern. The links are flat in some kinds, whilst in others they are made of circular bars of metal; and in the latter case they may be either twisted or untwisted. The smaller kinds of links are usually open or unstudded, whilst the larger ones, such as those employed in chain-cables, are provided with strengthening bars of metal, called studs, whose ends are welded to the inner surfaces of the broader sides of the link. Flat links are made in a fly-press and are connected together in different ways, either two with an interval between them alternating with two placed close together, or two alternating with one, three with two, four with three, and so on as far as nine with eight. The two-one flat-linked chain is often used for running on cogs. In the manufacture of the links of a chain-cable the iron is first cut into link-lengths, whose ends are then bevelled in opposite directions. The metal is then heated and bent into the elliptic shape round a vertical mandrel, the ends are securely welded together, and finally the supporting stud is welded along the minor axis of the ellipse. The next link is made in the same manner, but, of course, before closing it must be passed through the preceding one. In small linked chains the welding is made at the narrow end or crown, but in larger ones it is usually at the side. Twisted links are made in the same manner at first and are twisted afterwards. Chain-cables for mooring ships were first used in the merchant service, and were introduced into the British navy in 1812. Previously ropes had been employed as in ancient times. These cables are made in lengths of 15 fathoms, each length being usually provided with a swivel, and the successive lengths are connected together by special links called shackles.

CHALLENGER EXPEDITION, a scientific and exploring expedition sent out by the British government. The *Challenger*, a frigate-built ship of about 2000 tons, fully equipped with all the most improved scientific appliances for ascertaining the depth, temperature, currents, &c., of the ocean and the character of the ocean-bottom, and for amassing specimens in natural history, set sail from Sheerness on Dec. 7th, 1872. Captain (later Sir) George S. Nares was in command of the naval surveying staff, and Professor (later Sir) Wyville Thomson was placed at the head of the scientific men attached to the ship. She sailed first to Madeira and Teneriffe, thence across the Atlantic to the Bermudas, from which she proceeded north to Nova Scotia (Halifax). Recrossing to the Azores she continued her course by the Cape Verd Islands to the Cape of Good Hope by way of Fernando Noronha and Bahia. After being refitted here, she again set sail in December, 1873, and proceeded by Prince Edward and Kerguelen Islands and the Antarctic waters to Melbourne and Sydney. At Sydney she was again overhauled, and on her departure she cruised about the Pacific and the China Sea, ultimately arriving in Hong Kong for a further refitting. Captain Nares here demitted his command in order to take charge of the North Polar Expedition, and he was succeeded by Captain Frank Thomson. The subsequent course of the *Challenger* was by Japan to Valparaiso, whence she returned home through Magellan's Strait, arriving at Spithead on May 24th, 1876. During the three and a half years of the cruise the ship traversed about 70,000 nautical miles and accumulated a very large number of highly important observations. Under the supervision of Sir Wyville Thomson and Sir John Murray have been published: The Scientific Results of the Voyage of H.M.S. *Challenger*, comprising the Narrative (1885), Meteorological and Magnetic Results (1882), Physics and Chemistry

(3 vols., 1884–89), Botany (2 vols., 1885–86), and Zoology (32 vols., 1880–92). Amongst the more popular works on the expedition are Prof. Moseley's Notes by the Naturalist on board the *Challenger* (1879); Spry's Cruise of the *Challenger* (1877, later edition 1881); Sir Wyville Thomson's Voyage of the *Challenger*: General Results (2 vols., 1878); and At Anchor (1878) by Dr. J. J. Wild, the last-named being a narrative of the voyage.

CHALMERS, George Paul, Scottish painter, was born at Montrose in 1833, and received his education there. After serving in succession under a surgeon and a ship-chandler, he went to Edinburgh in 1853 in order to become an artist. He was elected an Associate of the Royal Scottish Academy in 1867, and four years later he was elected to full membership. He died at Edinburgh on Feb. 28th, 1878, apparently from the effects of a night assault by some unknown persons. His pictures, which are characterized by rich colouring, consist mainly of portraits and subjects, though during his later years he produced several landscapes. The most important are the Favourite Air (1864), End of the Harvest (1873), Running Water (1875), Threescore Years and Ten (1875, exhibited at the Royal Academy), Prayer (1876), Knitting (1876), and The Legend (unfinished).

CHAMA, the gaping cockle, a genus of large marine bivalves. The giant clam, *Chama gigas*, is the largest shell yet discovered, sometimes measuring 4 feet across. It is found in the Indian Ocean.

CHAMBA, a Punjab hill state north of Kangra, about lat. 32°–33° N. and long. 76°–77° E. Area, 2126 sq. miles, and pop. 124,032. The reigning family is Rájput. The chief town has the same name.

CHAMBERLAIN, Joseph, English statesman, eldest son of the late Mr. Joseph Chamberlain, was born in London in July, 1836, and educated at London University School. Like his father he became a member of a large firm of screw-makers at Birmingham, but gave up active connection with the business in 1874. He early became prominent in Birmingham both in connection with civic and political affairs, being an advanced radical and an able speaker, and was chairman of the school-board, and thrice in succession mayor of the city (1874–76). He contested Sheffield as a parliamentary candidate in the Radical interest in 1874, but without success. In 1876 he entered parliament as a representative of Birmingham, and at the general election of 1880 he was chosen for the same city along with Mr. Bright and Mr. Muntz. He soon became a prominent speaker in the House, and gradually came to be regarded as the leader of the advanced Radicals. Under Mr. Gladstone as premier he became president of the Board of Trade and a cabinet-minister, and was able to pass a Bankruptcy Act (subsequently amended), though he failed with his merchant shipping bill. In the Gladstone government of 1886 he was president of the Local Government Board; but his leader's Irish policy caused him to resign, and since then, as member for West Birmingham, he has been one of the most pronounced members of the Liberal-Unionist party and their leader in the House of Commons. In the winter of 1887–88 he was in America as one of the British representatives appointed to negotiate a settlement of the fishery disputes between Canada and the United States. On the formation of the Unionist ministry in 1895 Mr. Chamberlain became colonial secretary under Lord Salisbury, and in that capacity his chief aim has been to unite more closely the colonies with the mother country. During his tenure of office he has had various difficult matters to handle, such as the negotiations concerning the so-called 'Jameson raid' on the Transvaal in Dec. 1895, and the French claims in West Africa. On news of the 'raid' being received, Mr. Chamberlain at once repudiated all connection with it on the part of the British authorities; and he subsequently denied in the most distinct manner having had any personal foreknowledge or suspicion of what was about to take place. His conduct of the negotiations with the South African Republic preceding the outbreak of war in 1899 met with enthusiastic support from many and severe censure from others. He had much to do with the passing of the Workmen's Compensation Act of 1897. In 1896 the students of Glasgow University elected him Lord Rector. An edition of his speeches was produced in 1885 under the editorship of Mr. H. W. Lucy, and in 1887 his speeches on Home Rule and the Irish Question were published.

CHAMBERS, William, an eminent publisher and miscellaneous writer, was born at Peebles on the 16th April, 1800. As regards his parentage and early life, see Chambers, Robert. He was less of a literary man than his brother, but several productions proceeded from his pen. In 1839, for instance, he published an account of a tour in Holland and the Rhine Countries; and accounts of subsequent tours in France (1849), America (1853), and Italy (1862) were afterwards published. In 1849 he purchased the estate of Glenormiston, Peeblesshire, and in 1859 bestowed on his birthplace the commodious suite of buildings known as the Chambers Institute, comprising a library, reading-room, lecture-room, art-gallery, and museum. Of his native county he published a history in 1864. In 1865 he was elected Lord Provost of Edinburgh, in which capacity he organized and carried out many extensive and useful measures of sanitary improvement. Between 1871 and 1883 he spent upwards of £20,000 on the restoration of St. Giles' Cathedral, Edinburgh. He received the degree of LL.D. from the University of Edinburgh in 1872, in which year he published a very interesting memoir of his brother. It was the intention of the government to confer a baronetcy on him, but the patent had not been signed when his death occurred, 20th May, 1883.

CHAMBERTIN, a superior kind of red Burgundy wine, named after the place where it is produced.

CHAMBORD, Henri Charles Ferdinand Marie Dieudonné, Comte de, Duke of Bordeaux, the last representative of the elder branch of the French Bourbon dynasty, called by his partisans Henry V. of France. He was born at Paris on Sept. 29th, 1820, seven months after the assassination of his father, Prince Charles Ferdinand d'Artois, Duc de Berry. Charles X., after the revolutionary outbreak of 1830, abdicated in his favour; but the young count was compelled to leave the country with the royal title unrecognized by the nation. He lived successively in Scotland, Austria, Italy, and London, keeping a sort of court, and occasionally issuing manifestoes. In 1846 he married the Princess Maria-Theresa, eldest daughter of the Duke of Modena; and in 1851 inherited the domain of Frohsdorf, near Vienna, where for the most part he subsequently resided. While abstaining from violent attempts to seize the crown, he let slip no opportunity of urging his claims, especially after Sedan; but his belief in divine right, his devotion to the see of Rome, and his failure to recognize accomplished facts and modern tendencies, destroyed all chance of his succession. He died at Frohsdorf on Aug. 24th, 1883, leaving no heir.

CHAMPIGNON, a name given to the common

mushroom of Britain (*Agaricus campestris*). See Agaric.

CHANDPUR, a town of India, in the Bijnaur district of the North-West Provinces; about 40 miles E.N.E. of Meerut. It is thriving, well paved and drained; there is a trade in sugar and grain, besides some manufactures of cotton cloth, pipes, &c. Pop. (1891), 12,256.

CHANK-SHELL, the common conch-shell (*Turbinella pyrum*), of a spiral form, worn as an ornament by the Hindu women. A shell with its spires or whorls turning to the right is held in peculiar estimation and fetches a high place. The chank is one of the gasteropodous mollusca.

CHANT, a short musical composition adapted to the singing of the psalms and canticles. Chants are single when adapted to a single verse, and double when adapted to two verses, the former consisting of two strains of three and four bars respectively, and the latter being of twice that length. More recently quadruple chants extending over four verses have been introduced. The complete chant consists of four parts, namely (1) the intonation or initial phrase leading up to the reciting-note; (2) the reciting-note, which is the dominant of the mode employed; (3) the mediation, or main body of the chant; and (4) the termination, or concluding phrase. In modern Anglican chants, however, there is no intonation. The origin of the plain-song of the church is unknown, but the first attempt to reduce the traditional music to some definite system was made by Saint Ambrose, Bishop of Milan, who died in 397. More important, however, by far is the Antiphonarium of Gregory the Great, which appeared in the latter half of the sixth century and soon established itself as the chief and in fact only authority on Church music. The Gregorian tones were introduced into England by Saint Augustine, and in the course of their history in this country they underwent many modifications in the various local 'uses'. During the great Rebellion and the Commonwealth they went out of use, but were revived at the Restoration. Not long afterwards, however, the Gregorian chants began to give place to the modern double chants, and it is only in quite recent years that attempts have been made to revive them.

CHANTERELLE, a British edible mushroom (*Cantharellus cibarius*) of a bright orange colour, with a pleasant fruity smell, growing in woods and on dry pastures.

CHAPRA. See Chuprah.

CHAPTER-HOUSE, the building attached to a cathedral or religious house in which the chapter meets for the transaction of business. They are of different forms, being sometimes regular polygons of four, eight, or ten sides, and in other cases circles or parallelograms; and their architecture is often noteworthy. Sometimes they were the burying-places of clerical dignitaries.

CHARADRIUS, the genus to which the plover belongs, forming the type of the family Charadriadæ, which includes also the lapwings, dotterels, oyster-catchers, turnstones, sanderlings, &c. (which see).

CHARD, the leaves of artichoke (*Cynara Scolymus*) covered with straw in order to blanch them and make them less bitter. *Beet chards* are the leaf-stalks and midribs of a variety of white beet (*Beta Cicla*) in which these parts are greatly developed, dressed for the table.

CHARING-CROSS, the titular centre of London, so named from a cross which stood until 1647 at the village of Charing in memory of Eleanor, wife of Edward I. It is now a triangular piece of roadway at Trafalgar Square. The modern cross, erected in 1863, stands on about the same place as the older one, of which it is as nearly as possible a reproduction. It is built of Portland and Mansfield stone and Aberdeen granite, its style being the decorated Gothic of Edward's time. It cost about £1800.

CHARITES, the Greek name of the Graces (which see).

CHARJUI, a town in Bokhara, situated on the river Oxus at the point where it is crossed by the railway from Bokhara to the Caspian Sea. Its position makes it of considerable commercial importance.

CHARLES I., King of Spain. See Charles V., Emperor of Germany.

CHARLES XIV. See Bernadotte.

CHARLESTON PHOSPHATE, a valuable fertilizer obtained at Charleston, South Carolina, and classed as 'land' or 'river' phosphate, the latter being procured by dredging. The phosphate rock is also found in several other states, including Florida, North Carolina, and Tennessee. In 1897 nearly a million tons were mined, of which Florida supplied fully a half, and South Carolina rather less. In the manufacture of the fertilizers several imported chemicals are used, namely, sulphur pyrites and ore from Spain and Portugal, brimstone from Italy, kainit, manure-salt, and potash salts from Germany, and Chili saltpetre.

CHARLESTOWN, a town in the extreme north of Natal, on the railway from Durban to Johannesburg. It stands at a height of over 5300 feet. Majuba Hill is 4 miles distant.

CHARLOCK, the English name of *Sinapis arvensis*, a common yellow weed in cornfields, also called wild mustard. Jointed or white charlock is *Raphanus Raphanistrum*. It also is a common cornfield weed, but has white or straw-coloured flowers and jointed pods. Both these plants belong to the Crucifer family.

CHARLOTTE, a town of the United States, in North Carolina, Mecklenburg county, with a university and several manufactories. There are gold-mines in the vicinity. Pop. (1890), 11,557.

CHARNEL-HOUSE, a chamber or building under or near churches, where the bones of the dead are deposited. In England the crypts of some churches were formerly used as charnel-houses.

CHARPIE, lint for dressing wounds. See Lint.

CHARPOY, in the East Indies, a small portable bed, consisting of a wooden frame resting on four legs, with bands across to support the bedding.

CHARRAS, a resinous substance which exudes from the Indian hemp and is collected for use as a narcotic or intoxicant, forming a considerable article of trade in Asia. See Hemp.

CHARTULARY, a record or register in which the charters, title-deeds, &c., of any corporation were copied for safety and convenience of reference. They were often kept by private families. The oldest chartularies that have come down to us belong to the tenth century, and from the thirteenth century onwards they are very numerous. As materials for the historian, whether of law, customs, municipal rights, or in fact of almost any department of national life, their value can scarcely be over-estimated. Copies of several historical documents, whose originals are lost, have been found in chartularies.

CHASE, Salmon Portland, American statesman and jurist, was born in Cornish, New Hampshire, on Jan. 13th, 1808. Having adopted the law as his profession he settled at Cincinnati and acquired a practice there. He early showed himself an opponent of slavery, and was the means of founding the Free-soil party, which in time gave rise to the great Republican party—the power that brought the downfall of slavery. In 1849-55 he was a member of the United States Senate, in which he vigorously opposed the extension of slavery into the new territories. In 1855 he was elected governor of Ohio, being re-elected in 1857. In 1861 he was nominated secretary of the treasury, and in this post was signally successful in providing funds for carrying on the civil war. The famous non-interest-bearing treasury notes called 'greenbacks' were issued during his secretaryship. In 1864 he resigned office, and was appointed chief-justice of the supreme courts. He died in New York on May 7th, 1873.

CHAT, the popular name of birds of the genus *Saxicola,* belonging to the family Sylviadæ or warblers. They are small, lively birds, moving incessantly and rapidly about in pursuit of the insects on which they chiefly live. There are three species found in Britain, the stone-chat (*S. rubicola*), whin-chat (*S. rubetra*), and wheatear (*S. œnanthe*). The first two resemble each other very closely in habits, and are both found on heaths and furze-covered commons, but the whin-chat, unlike its larger relative, rarely winters in Britain. The wheatear is found on downs and fallow land, and also migrates southward in autumn. All three have pleasing songs, and feed on worms, insects, &c. The yellow-breasted chat of the United States is a larger bird, belonging to the genus *Icteria* (*I. polyglotta*), of the family Turdidæ or thrushes. See Stone-chat, Whin-chat, Wheatear.

CHÂTEAU-GAILLARD, a celebrated feudal fortress in France, near Andelys (Eure), built by Richard Cœur de Lion. As late as the fifteenth century it was considered one of the strongest fortresses in Normandy. Its picturesque situation on a high rock overlooking the river has made it a favourite subject for artists. Turner has twice represented it. See Andelys.

CHÂTEAU-LAFITTE, Château-Latour, Château-Margaux, famous vineyards, all in the department of the Gironde, France, furnishing the best of the red wines of Bordeaux. See Bordelais Wines.

CHÂTELET, a manufacturing town of Belgium, in the province of Hainaut, on the Sambre, 5 miles east of Charleroi. Its chief industries are the manufacture of cotton-stuffs, knives, nails, and pottery. Pop. (1897), 11,255.—Châtelineau, opposite to it, has a pop. of (1897) 11,519.

CHATHAM, a town of Canada, in New Brunswick, at the mouth of the Miramichi, and on its right bank, 98 miles N.E. of Fredericton, with a Roman Catholic cathedral and college, and a large trade in lumber. Pop. (1891), 5644.

CHATI, a species of small leopard found in South America, very destructive to small quadrupeds and birds, and especially to poultry-yards, but so gentle, when domesticated, as to have gained for itself the name of *Felis mitis,* or gentle leopard.

CHATTANOOGA, a town of the United States, capital of Hamilton county, Tennessee, on the Tennessee river, which is here navigable by steamboats for eight months in the year. It is an important railway centre, and contains saw-mills, iron and steel works, brick-works, cotton factories, &c. The surrounding country is rich in coal and iron, and is well wooded. During the civil war Chattanooga occupied an important strategic position, and here the Confederates were defeated in 1862 and again in 1863. Pop. (1880), 12,872; (1890), 29,100; with the suburbs the pop. is over 50,000.

CHATTERERS, the popular name of certain insessorial birds of the family Ampelidæ, genus *Ampelis,* as the Bohemian chatterer or waxwing (*Ampelis garrula*) and the chatterer of Carolina (*A. cedrorum*). See Cedar-bird in Supp. and Waxwing.

CHAUDFONTAINE, a village of Belgium, in the province and 4 miles from Liége, on the Vesdre, with hot springs much frequented in summer. Pop. (1897), 1811.

CHAUS (kā'us), a genus of Asiatic and African lynxes or cat-like animals, including the *Chaus Libyæus,* or Libyan chaus, and the *Chaus Caffer,* or Caffre-cat. They are fond of the water, and excellent swimmers. The word is also used as a name of the marsh-lynx (*Felis chaus*).

CHAUTAUQUA, a beautiful lake of Chautauqua county, in the extreme west of New York state, U.S., about 20 miles long and 1 to 2 broad, 726 feet above Lake Erie, from which it is 8 miles distant. There is a regular service of steamers between Mayville at its north-west end, and Jamestown at its south-east end. On its banks is the village of Chautauqua, the centre of a religious and educational movement of some interest. This originated in 1874, when the village was selected as a summer place of meeting for all interested in Sunday-schools and missions. Since then the Chautauqua Literary and Scientific Circle has taken origin here, the most prominent feature of which is to engage the members—wherever they may reside—in a regular and systematic course of reading, extending, when completed, over four years and entitling the student to a diploma. The head offices of this institution, from which the Chautauqua University has developed, are at Buffalo. There are many local branches or societies, and it has been attempted to start the movement in Britain.

CHAVICA, a genus of plants, of the natural order Piperaceæ, including the common long pepper, Java long pepper, and betel-pepper. The plants of this genus are shrubs very closely resembling those of the nearly allied genus *Piper,* and by some included in it. The leaves of the betel-pepper (*C.* or *Piper Betel*) form one of the ingredients of the masticatory, called *betel* (which see).

CHEE-FOO, also called *Yen-tai,* a town of China, in the province of Shantung, at the entrance to the Gulf of Pe-chi-li, about 40 miles W. of Wei-hai-Wei. It is one of the ports opened to foreign trade, which is now of considerable volume. The Chee-Foo Convention of 1876 extended British commerce in Chinese waters through the opening of four new ports. Pop. 32,000.

CHEESE-FLY, a small black dipterous insect bred in cheese, the *Piophila casei,* of the same family to which the house-fly, blow-fly, &c., belong. It has a very extensible ovipositor, which it can sink to a great depth in the cracks of cheese, and lay its eggs there. The maggot, well known as the cheese-hopper, is furnished with two horny claw-shaped mandibles, which it uses both for digging into the cheese and for moving itself, having no feet. Its leaps are performed by a jerk, first bringing itself into a circular attitude, when it can project itself twenty to thirty times its own length.

CHEESE-HOPPER. See above article.

CHEETAH. See Leopard.

CHEFOO. See Chee-Foo in Supp.

CHEILOGNATHA, or Chilognatha, one of the two orders of Myriapoda, including the millipeds and other forms. See Myriapoda.

CHEILOPODA, or Chilopoda, one of the two orders of Myriapoda, represented by the centipeds. See Myriapoda.

CHEIRANTHUS, a genus of plants of the order Cruciferæ, containing some twelve species, found in the Mediterranean region and in North America and the Himalaya. The best-known species is the wall-flower (*C. Cheiri*), which is found wild in some parts of Britain. See WALL-FLOWER.

CHEIROMYS. See AYE-AYE.

CHEIRON. See CHIRON.

CHEIRONECTES, a genus of acanthopterygious fishes, having the pectoral fins supported, like short feet, upon peduncles, by means of which they are enabled to creep over mud and sand when left dry by the receding tide, and also to take short leaps like a frog, whence the name frog-fish, as well as hand-fish. They are found in the estuaries of the north-east of Australia.—The same name belongs to a Brazilian genus of opossums, in which the hinder-hands are webbed, the Yapock opossum. See OPOSSUM.

CHEIROTHERIUM. See LABYRINTHODON.

CHELIDONIUM, a genus of plants of the order Papaveraceæ, containing only one species, the *greater celandine* (*C. majus*). See CELANDINE in SUPP.

CHELMSFORD, FREDERIC AUGUSTUS THESIGER second BARON, eldest son of the first Lord Chelmsford, who was twice lord-chancellor. He was born on May 31st, 1827, and educated at Eton. Entering the army in 1844, he became an ensign in the Grenadier Guards in the following year. Promoted captain in 1850, he became lieutenant-colonel in 1857, and colonel in 1863. He served in the Crimea and through the Indian mutiny. As deputy adjutant-general he served in the Abyssinian campaign, was nominated C.B., made aide-de-camp to her Majesty, and adjutant-general to the forces in India (1868–76), and in 1877 was appointed commander of the forces and lieutenant-governor of Cape Colony. He restored Kaffraria to tranquillity, and was given the chief command in the Zulu war of 1879. After great difficulties with the transport, and some disasters, such as those of Isandhlwana and Intombi, he gained the decisive victory of Ulundi on July 4th, before the arrival of Sir Garnet Wolseley, who had been sent to supersede him. On his return to England he was made G.C.B., and in 1884 became lieutenant of the Tower, a post which he held till 1889. He was promoted to the rank of lieutenant-general in 1882, and in 1888 he was created a general. In 1893 he went on the retired list.

CHELSEA, a town of the United States, in Suffolk county, Massachusetts, forming a north-eastern suburb of Boston, from which it is separated by the Chelsea and Mystic rivers, the latter spanned by a long bridge. It has important manufactures, and contains a United States marine hospital. Pop. (1890), 27,909.

CHEMULPO, the most important treaty port of Corea, on the W. coast, about 25 miles from Söul. It consists of a native, a Chinese, a Japanese, and a foreign quarter, and was opened in 1883. Its trade is of considerable value, the chief exports being rice, ginseng, cow-hides, beans, and millet; and the chief imports are cotton and woollen goods, metals, railway plant and machinery, oils, grass-cloth, timber, &c. In 1898 the number of vessels entered was 1158 of 186,359 tons, mostly Chinese and Japanese. In 1897 a railway to the capital was begun. Pop. (foreign) in 1896, 4679, of whom 4148 were Japanese.

CHENILLE, a sort of ornamental fabric of cord-like form, made by weaving or twisting together warp-threads, with a transverse filling or weft, the loose ends of which project all round in the form of a pile. Chenille carpets have a weft of chenille, the loose threads of which produce a fine velvety pile.

CHENOPODIACEÆ, a natural order of apetalous dicotyledons, consisting of more or less succulent herbs or shrubs, belonging to about 80 genera and 600 species. They are mostly innocent weeds, but several are employed as pot-herbs, such as spinach and beet, and others for the manufacture of soda. See CHENOPODIUM (the type genus).

CHER, a river of Central France, rising in Auvergne in the department Creuse, and joining the Loire from the left near Tours; length, 220 miles. It is navigable to Vierzon. This river gives name to the department of Cher (which see).

CHERBULIEZ, CHARLES-VICTOR, novelist and political writer, was born on July 19th, 1829, at Geneva, his father being Jean Louis André Cherbuliez, a Swiss scholar. He was educated first in his native city, and afterwards at Paris, Bonn, and Berlin. His first literary production was an archæological essay, A propos d'un Cheval, published in 1860, and reprinted four years later as Un Cheval de Phidias; and since then he has produced other works of the same class. Le Comte Kostia, published in 1863, was his first novel, and was followed in 1864 by Paul Méré. The most important of his other romances are Le Roman d'une honnête Femme (1866); Prosper Randoce (1868); L'Aventure de Ladislas Bolsky (1869); Samuel Brohl et Cie. (1877); L'Idée de Jean Têterol (1878); Amours Fragiles (1880); Noirs et Rouges (1881); La Ferme du Choquart (1883); La Bête (1887); La Vocation du Comte Ghislain (1888); Une Gageure (1890); L'Art et la Nature (1892); Le Secret du Précepteur (1893); Après Fortune Faite (1895); and Jaquine Vanesse (1898). M. Cherbuliez has been on the staff of the Revue de Deux Mondes since 1864, and many able political and historical articles from his pen have appeared in that periodical over the name of G. Valbert. Of these several selections have been published, including L'Allemagne politique depuis la Paix de Prague (1870); L'Espagne politique (1874); Hommes et Choses d'Allemagne (1877); Hommes et Choses du Temps Présent (1883); and Profils Étrangers (1889). Some of his novels have been dramatized, but in that form they have had only moderate success. He became a naturalized French citizen in 1870, and in 1881 was elected a member of the French Academy in place of M. Dufaure. Professor Saintsbury has an appreciation of him in his Essays on French Novelists (1891).

CHERIMOYER, the fruit of the *Anona Cherimolia*, a plant of the order Anonaceæ, native of South and Central America, allied to the custard-apple. It is a heart-shaped fruit with a scaly exterior, and numerous seeds buried in a delicious pulp. Both flowers and fruit emit a pleasant fragrance. This fruit is now cultivated in various tropical regions. See CUSTARD-APPLE.

CHERNIGOV. See CZERNIGOV.

CHEROOT. See TOBACCO.

CHERSO, a long, narrow island in the northern Adriatic belonging to Austria, yielding wine, olives, and other fruits. It is situated in the Gulf of Quarnero, between Veglia and the mainland, and forms part of Istria. The town of the same name stands on the W. coast, and has a population (1890) of 4725. Pop. of island (1890), 10,180.

CHERT, a variety of quartz, called also *Hornstone* or *Rock-flint*. It is less hard than common quartz, and is usually amorphous, sometimes globular or in nodules. Siliceous concretions occurring as nodules and layers in limestone rocks are also called chert. See QUARTZ.

CHERVIL, the popular name of umbelliferous plants of the genus *Chærophyllum*, but especially of *C. temulum*, the only British species, a hairy weed with longish grooved fruits. Garden chervil is *Anthriscus Cerefolium*, an umbelliferous plant much used in soups and salads in some European countries. The parsnip chervil (*A. bulbosus*) has a root like a small carrot, with a flavour between that of a chestnut and a potato. Sweet chervil, sweet cicely, or myrrh, is *Myrrhis odorata*, an aromatic and stimulant umbellifer formerly used as a pot-herb, growing in a semi-wild state in Britain.

CHESNUT. Chestnut.

CHESTER, a town of the United States, in Delaware county, Pennsylvania, on the Delaware, 15 miles s.w. of Philadelphia. It is the oldest town of the state, and contains the Pennsylvania Military Academy, a Baptist theological seminary, a Quaker college, steel-works, rolling-mills, ship-yards, manufactures of cottons and woollens, &c. Upland and South Chester are suburban boroughs. Pop. (1890), 20,226.

CHESTER-LE-STREET, a town of England, in the county and 6 miles N. of Durham, giving name to a parliamentary division of the county. It has coal-mines and confectionery works. Pop. (1891), 8623.

CHEST-FOUNDERING, a disease in horses, a rheumatic affection of the muscles of the chest and fore-legs, impeding both respiration and the motion of the limbs. It in some degree corresponds with what is called pleurisy in man.

CHETAH, the *Felis jubata* (*Cynailurus jubatus*), or hunting leopard of India. See Leopard.

CHEVALIER, Michel, a celebrated economist, was born at Limoges in France, Jan. 13th, 1806. He was educated as an engineer in the School of Mines, joined the St. Simonians, and suffered six months' imprisonment for promulgating the free doctrines of Père Enfantin's party. On his liberation M. Chevalier renounced his extreme doctrines, and was sent to the United States and to England on special missions. He became a councillor of state (1838), professor of political economy in the Collège de France (1840), member of the chamber of deputies for Aveyron (1846), and member of the Institute (1851). By this time he had written a number of works, of which the most important are Lettres sur l'Amérique du Nord (1836); Des Intérêts Matériels en France: travaux publics, routes, canaux, chemins de fer (1838); Essais de Politique Industrielle (1843); Cours d'Economie Politique (1842–50); Lettres sur l'organisation du Travail (1848); Examen du Système Commerciale connu sous le nom de Système Protecteur (1851); and Questions Politiques et Sociales (1852). He was known as a strong advocate of free-trade, and as a specialist on questions of currency. Many of his writings are directed against the socialist beliefs of his earlier years. Along with Cobden and Bright he had a great part in the commercial treaty of 1860 between France and Britain. He died on Nov. 28th, 1879, at Montplaisir.

CHEVROTAIN, or Kanchil (*Tragulus pygmæus*), a species of small musk-deer found in India and South-eastern Asia and the islands. See Musk-deer.

CHEYENNE, a town of the United States, capital of the state of Wyoming, in Laramie county, on the Union Pacific Railway, where it is joined by the Denver Pacific, 106 miles N. of Denver, at an elevation of about 6000 feet above the sea. It is a rising place, situated in a district containing coal and iron. There are large railway-works, and a considerable trade is carried on. The state capitol, the public library, and the high school are among the chief buildings. Pop. (1890), 11,690.

CHEYNE, Rev. Thomas Kelly, Biblical scholar, born in London, Sept. 18th, 1841, was educated at Merchant Taylors' School, Worcester College, Oxford, and Göttingen. At Oxford he carried off several theological prizes and also gained, in 1864, the Chancellor's Medal for an English essay. In 1868 he was elected Fellow of Balliol College, from 1880 till 1885 he was Rector of Tendring in Essex. In the latter year he was appointed to the Oriel Professorship of the Interpretation of Scripture at Oxford, also becoming Canon of Rochester. He edited the old Testament portion of the Variorum Bible for Messrs. Eyre and Spottiswoode, and in 1884 he became a member of the Old Testament Revision Company. His works are numerous, and deal exclusively with the exposition and criticism of the Old Testament books. They include Notes and Criticisms on the Hebrew Text of Isaiah (1868); The Book of Isaiah Chronologically Arranged (1870); The Prophecies of Isaiah (2 vols. 1880-81, new ed. 1884); The Book of Psalms translated (1884); Job and Solomon (1887); The Book of Psalms or Praises of Israel (1888); Jeremiah: his Life and Times (1888); The Hallowing of Criticism (1888); The origin and Religious Contents of the Psalter (1891); Founders of Old Testament Criticism (1893); Introduction to the Book of Isaiah (1895); and Religious Thought and Life among the Hebrews (1898). He has also written many articles on similar subjects in various periodicals, and is a large contributor to the Encyclopædia Biblica, of which he is also joint-editor. Canon Cheyne's works reveal a scholarly and able attempt to reconcile the views of the advanced critics of the Bible with those belonging to the evangelical school.

CHIAN TURPENTINE, a greenish-yellow, non-acrid turpentine or resin obtained mainly from the island of Chios (Scio), yielded by *Pistachia Terebinthus*, of the order Anacardiaceæ, a large tree, native to the Mediterranean islands and shores. The turpentine, now used only in medicine, exudes from the tree in small quantities during the warmer months, but it is obtained at other seasons by making incisions in the bark. It is called also Cyprus turpentine.

CHIASTOLITE, a mineral, a silicate of aluminium, having crystals arranged in a peculiar manner. The form of the crystals is a four-sided prism, whose bases are rhombs differing little from squares, but each crystal, when viewed at its extremities or on a transverse section, is obviously composed of two very different substances, and its general aspect is that of a black prism passing longitudinally through the axis of another prism which is whitish.

CHICACOLE or Chikakol, a town of India, in the Ganjam district, Madras Presidency, near the coast, about 60 miles N.E. of Vizagapatam and 567 miles N.E. of Madras, notable for its fine muslin manufactures. On two occasions, namely in 1791 and 1866, it suffered much from famine, and in 1876 a flood did considerable damage to the town, destroying a large part of the bridge across the Langulya river. Pop. (1891), 18,241.

CHICKAHOMINY, a river in Virginia, rising about 20 miles N.W. of Richmond, flowing S.E. till it joins the James River, after a course of about 75 miles. Near this river many important battles during the civil war took place — the battle of Williamsburg, of the Seven Pines, of Gaines's Mill, &c.

CHICKAMAUGA, a small tributary of the Tennessee River, state of Tennessee, U.S., where a battle took place Sept. 19–20, 1863, between the Federal troops under Rosecrans and the Confederates under Bragg and Longstreet, the latter gaining the victory.

CHICKASAW INDIANS, a tribe of American

Indians of the Appalachian nation. In 1833 they gave up to the United States the last of their lands south of the Tennessee River, receiving as compensation a money indemnity and new lands on the left bank of the Red River, in the Indian Territory. The Chickasaws number about 8000. They have made considerable advances towards civilization, have a senate, house of representatives, and a considerable sum of money in deposit with the government.

CHICKEN-POX (Varicella), an infectious disease mainly confined to children. It commences with feverishness, and an eruption of pimples, which speedily become blebs filled with clear fluid and as large as split-peas. Within a week these dry up into dark-coloured scales, which within another week have fallen off. The disease is never fatal, and has no evil results. A little opening medicine and a mild diet is all the treatment required.

CHICK-PEA, the popular name of *Cicer arietinum* and other plants of the same genus, growing wild along the shores of the Mediterranean and in many parts of the East, and producing a short puffy pod with one or generally two small wrinkled seeds. It is an important article in French and Spanish cookery, and the plant is cultivated in Europe, Egypt, Syria, India, Mexico, &c. When roasted it is the common *parched pulse* of the East. The herbage serves as fodder for cattle. The chick-peas are leguminous plants of the vetch tribe, differing from the vetches (*Vicia*—which see) mainly in the fruit. Seven species are known, having the flowers solitary or in small axillary groups.

CHICOPEE, a city of the United States, in Hampden county, Massachusetts, on the river Connecticut, at the mouth of the Chicopee, 4 miles N. of Springfield, with manufactures of cotton, artillery, bronze, bicycles, rifles, swords, paper, &c. Manufacturing power is furnished by the Chicopee river. Pop. (1890), 14,050.

CHIFF-CHAFF (*Sylvia hippolais* or *Phylloscopus collybita*), a bird of the warbler family, so named from its cry. Its head, back, and upper wings are ashy brown, and its under parts are brownish green dashed with yellow. In length it is between 4 and 5 inches, and it frequents woods, hedges, and thickets. Arriving in England in March, it remains usually till well on into the autumn. It is known to reach as far north as south-western Scotland. The food of the chiff-chaff consists of the larvæ of various insects and some of the smaller moths. See Warblers.

CHIGOE or Jigger, a very curious insect (*Pulex* or *Sarcopsylla penetrans*), closely resembling the common flea, but of more minute size, prevalent in the West Indies and South America, and latterly also in considerable portions of Africa. It burrows beneath the skin of the foot, and soon acquires the size of a pea, its abdomen becoming distended with eggs. If these eggs remain to be hatched beneath the skin great irritation and even troublesome sores are sure to result. The insect must be extracted entire, and with great care, as soon as its presence is indicated by a slight itching or tingling.

CHIH-LI or Pi-chi-li, one of the northern provinces of China, bounded by Mongolia on the N. and by the Gulf of Pe-chi-li on the E., and watered by the Pei-ho and several other rivers. In the north there are extensive unworked seams of anthracite, and the southern portions of the province are very fertile, the chief productions being cotton, tobacco, and various cereals. Some districts have at times suffered from floods and dust-storms. The chief town is Peking, the imperial capital. Area about 59,000 sq. miles, pop. 18,000,000.

CHILLED IRON, iron cast in metal moulds called *chills*, where, on account of the rapid conducting of the heat, the iron cools more quickly on the surface than it would do if cast in sand. Chilled iron is whiter and has a harder surface than iron cast in any other way. It is used in making axle-boxes, hubs, ploughshares, and some hammers and anvils.

CHILLIES, the fruits of the Capsicum, used to make cayenne pepper, pickles, and chilli vinegar. See Cayenne Pepper.

CHILO. See Chilon.

CHILOGNATHA, Chilopoda. See Myriapoda.

CHIMÆRA, a genus of cartilaginous fishes. Three or four species are recognized, the best known being the *Chimæra monstrosa*, which inhabits the northern seas, and is sometimes called *king of the herrings*. See King of the Herrings.

CHIMERE, the upper robe to which the lawn sleeves of a bishop are attached. It is of purple silk amongst the Roman Catholics and of black satin in the English Church.

CHIMOIO, a town in Portuguese East Africa, near the border of Mashonaland, 118 miles from Beira on the coast. A railway connects it with Fontesvilla, 28 miles N.W. of Beira, and is being continued inland to Salisbury.

CHINA, Great Wall of, the largest artificial structure on the face of the earth, a barrier extending for about 1500 miles in the north of China proper, of which it partly forms the boundary. Its western end is in the deserts of Central Asia, its eastern reaches the sea to the north-eastward of Peking. It was erected as a barrier against the inroads of the barbarous tribes, and dates from about 214 B.C. It is carried over height and hollow, and avoids no inequality of the ground, reaching in one place the height of over 5000 feet above the sea. Earth, gravel, brick, and stone were used in its construction, and in some places it is much more substantial than in others. Its greatest height, including the parapet on its top, is about 50 feet, and it is strengthened by towers at regular distances.

CHINA ASTER, the common name of *Callistephus chinensis*, a composite plant, hardy and free flowering. See Aster.

CHINA-CLAY. See Kaolin.

CHINA ROOT, the root or rhizome of *Smilax China*, a climbing shrubby plant closely allied to sarsaparilla, for which it is sometimes used. *Vitis sicyoides*, a species of vine, is known by this name in Jamaica. See Sarsaparilla and Smilaceæ.

CHINA ROSE, the name given to a number of varieties of garden rose chiefly derived from *Rosa indica* and *R. semperflorens*, both natives of China. The name is also given to *Hibiscus rosa-sinensis*, one of the mallow tribe, common in China and the East Indies, and an ornament in hothouses.

CHINA WAX, a sort of wax deposited by insects on a deciduous tree with light-green, ovate, serrated leaves, cultivated in the province of Si-chuen (Ssuchuan) in South-western China. The insects (*Ericerus pela*, *Coccus sinensis* or *C. pela*) are bred in galls which are formed on a different tree, an evergreen (a species of Ligustrum or privet), and these galls are transported in great quantities to the districts where the wax-trees are grown, to the branches of which they are suspended. Having emerged from the galls the insects spread themselves over the branches, which gradually become coated with a white waxy substance, reaching in 90 or 100 days the thickness of a quarter of an inch. The branches are then lopped off and the wax removed. It is white in colour, and is chiefly made into candles; it melts at 160°, whereas tallow melts at about 95°.

CHINCH, the popular name of certain fetid American insects of the family Lygæidæ, genus *Rhyparochromus*, resembling the bed-bug, very destructive to wheat, maize, &c., in the southern and western states. The name is also applied to the common bed-bug (*Cimex lectularius*).

CHINDE, a town on the only navigable mouth of the Zambesi. Here the inland steamers meet the ocean steamers of various European companies; and here, too, Britain has obtained from Portugal a small piece of land called the 'British Concession', for commercial purposes, and a residential district called the 'Extra Concession'.

CHINESE OLIVE, the fruit of *Canarium commune*, of the order Amyridaceæ, a tree of the Asiatic archipelago yielding an oil which is used as a condiment and for lamps.

CHINESE WHITE, a valuable pigment prepared from the white oxide of zinc (ZnO), introduced into the arts in the latter part of the eighteenth century as a substitute for the preparations of white-lead. Its colour is not changed by exposure to the air.

CHINIOT, a town of Hindustan, in the Jhang district of the Punjab, near the Chenab. It is famed for wood-carving, and has manufactures of coarse cloth. Its trade is also of considerable importance. Pop. (1891), 13,476.

CHINKAPIN, the American dwarf chestnut (*Castanea pumila*), a small tree growing in the United States. Like the common chestnut (*C. vesca*), its fruits are edible, and the bark is used in tanning.

CHINTZ, cotton cloth or calico printed with flowers or other devices in various colours and now generally glazed. Originally a manufacture of the East Indies, it is now largely manufactured in Europe. Chintz is used mostly for curtains of various kinds on account of the fact that dust will not adhere to its glazed surface.

CHIOCOCCA, a genus of tropical plants, of the natural order Rubiaceæ, consisting of small, often climbing, shrubs, with opposite, stipulate leaves and bell-shaped or funnel-shaped, yellowish flowers in axillary clusters. The fruit is a white berry with two seeds. The bark of the root of *C. anguifuga* is a violent emetic and purgative. Six species are known.

CHIOS. See Scio.

CHIPMUNK, Chipmuck, the popular name in America of the ground-squirrel, genus *Tamias*. See Squirrel.

CHIPPING SPARROW (*Spizella socialis*), a common North American bird allied to the chaffinch, some 5 or 6 inches long, whose song consists of about half a dozen notes uttered in quick succession. It is also called *chip-bird*, *chippy*, &c.

CHIPPING-WYCOMBE. See Wycombe.

CHIRETTA. See Chirata.

CHIRONECTES. See Cheironectes in Supp.

CHIRU, *Antilope* (or *Pantholops*) *Hodgsonii*, a fine large species of antelope found in Tibet, somewhat larger than the chamois. It is specially characterized by its swollen nose and its long horns, the latter, however, being found only in the males. The upper parts are fawn-coloured, the under parts being grayish. The chiru is sometimes found in small herds, but usually in large companies.

CHITALDRUG. See Chitteldroog.

CHITTAGONG WOOD, the wood of several Indian trees, especially of *Chickrassia tabularis*, of the order Meliaceæ, a light-coloured beautifully-grained wood used by cabinet-makers. The wood of *Cedrela Toona* receives the same name. See Toon in Supp.

CHLAMYPHORUS, a genus of quadrupeds of the order Edentata. The only species, *C. truncatus*, or pichiciago, resembles the mole in its habits; it is about 5 inches long, and its back is covered over with a coat of mail, consisting of twenty-four rows of tough leathery plates. Its internal skeleton in several respects resembles that of birds. It is a native of South America, and nearly allied to the armadillo.

CHLAMYS, a light and freely-flowing scarf or plaid worn by the ancient Greeks as an outer garment. It was oblong in shape, generally twice as long as its width, and was worn, according to taste or circumstances, in different ways. The chlamys of the youth was probably of a yellow colour, whilst that of the soldier was scarlet. It was also carried by hunters and travellers, and some Romans are recorded as having adopted it.

CHLORATE, a salt of chloric acid. The chlorates are very analogous to the nitrates. They are decomposed by a red heat, nearly all of them being converted into metallic chlorides, with evolution of pure oxygen. They deflagrate with inflammable substances with such facility that an explosion is produced by slight causes. The chlorates of sodium and potassium are used in medicine. The latter, in doses of from 5 to 20 grains, is largely used in scarlet fever, inflamed throat, &c. It is also used in the manufacture of lucifer-matches, fireworks, and percussion-caps, in dyeing and calico-printing, and as a source of oxygen in the laboratory.

CHLORIC ETHER, or ethyl chloride, a volatile liquid (C_2H_5Cl) obtained by passing hydrochloric acid gas into alcohol to saturation and distilling the products, or by the action of metallic chlorides upon alcohol. It is a colourless liquid at ordinary temperatures, has a specific gravity of about ·92, and boils at 54°·5 F. It has a strong ether-like smell and a sweet taste, and is employed in medicine mixed with an equal bulk of alcohol. This mixture is called *alcoholized muriatic ether*, and may be used for the same purposes as ether. It is called also *Hydrochloric Ether*.

CHLORODYNE, a patent medicine composed of certain proportions of chloroform, opium, prussic acid, and perhaps also Indian hemp, the whole being flavoured with peppermint and sugar. The mixture is taken with the purpose of inducing sleep or allaying pain, the average dose being 10 to 15 drops, smaller doses, however, being preferable at the commencement. This medicine is the invention of Dr. Collis Browne, and having become rather popular, various compounds of a like nature and similar name are made and sold by apothecaries.

CHLOROSPERMEÆ, or Chlorophyceæ, a division of the algæ. In these the thallus is of very various form, and is coloured green by chlorophyll, though in a few cases the green colour is masked by the presence of brown and other pigments.

CHOCTAWS, a North American Indian tribe now settled on a portion (10,450 square miles) of the Indian Territory on the Red River. They formerly inhabited what is now the western part of Alabama and southern part of Mississippi. They cultivate the soil, are partially civilized, having a regular constitution prefaced with a bill of rights, courts of justice, books and newspapers. See Indians (American).

CHOKE-CHERRY, a popular name for one or more species of cherry (such as *Prunus* or *Cerasus borealis*, *Prunus virginiana*), so-called from their astringency. Infusions of the bark of *P. virginiana* are used as remedies for nervousness, feverishness, and consumption.

CHOLAGOGUE, a medicine which has the property of carrying off bile. Among the chief purgative cholagogues are podophyllin, euonymin, rhubarb, calomel, aloes, colocynth, scammony, jalap, phosphate of soda, Glauber's salt, and Rochelle salts.

CHONOS ARCHIPELAGO, or Guaytecas Islands, a group of islands belonging to the Chilian province of Chiloe, lying off the w. coast of Patagonia, mostly between lats. 44° and 46° s., and lon. 74° and 75° w. Two are large, but they are all barren and scantily inhabited. Magdalena is the largest island.

CHOREA. See Vitus's Dance, St.

CHORION, in anatomy, the external vascular membrane, covered with numerous villi or shaggy tufts, which invests the fetus in utero. See Placenta.

CHOROID, a term applied in anatomy to various textures; as, the *choroid membrane*, one of the membranes of the eye, of a very dark colour, situated between the sclerotic and the retina, and terminating anteriorly at the great circumference of the iris. See Eye.

CHOTIN. See Khotin in Supp.

CHRETIEN DE TROYES, a French trouvère, who was born at Troyes about 1150, and died about the end of the twelfth or beginning of the thirteenth century. He translated Ovid's Ars Amandi into French, and probably wrote some works based on the classics, but his fame rests upon the still extant romances of Arthur and the Knights of the Round Table, the materials for which were obtained from Geoffrey of Monmouth's rather credulous History of Britain. They are entitled Iric et Guide, Perceval le Gallois, Le Chevalier au Lion, Cliget, Chevalier de la Table Ronde, Lancelot du Lac, and Guillaume d'Angleterre, but the authorship of the last-named is doubtful. Other two of his works, Tristan, ou le Roi Marc et la Reine Yseult, and Le Chevalier à l'Épée, have been apparently lost.

CHRISTADELPHIANS, a religious body that originated during the American Civil war, their founder being Dr. J. Thomas. They believe that God will raise all who love him to an endless life in this world, but that those who do not shall absolutely perish in death; that Christ is the Son of God, inheriting moral perfection from the Deity, our human nature from his mother; and that there is no personal devil. Their chief newspaper in Britain is The Christadelphian, published in Birmingham. The works of Dr. Thomas and Christendom Astray by Robert Roberts contain expositions of their religious views.

CHRISTIAN CONNECTION. See Christians.

CHRISTIAN ERA, the great era now almost universally employed in Christian countries for the computation of time. It is generally supposed to begin with the year of the birth of Christ; but that event seems to have taken place four years before the present established beginning of the era. Time before Christ is marked B.C., after Christ A.D., that is, Anno Domini, in the year of the Lord. The era is computed from the 1st January in the fourth year of the 194th olympiad, and the 753rd year from the building of Rome. It was first used by Dionysius, a Syrian monk, in the sixth century, but did not become general until about the middle of the fifteenth century. See Chronology and Olympiad.

CHRISTISON, Sir Robert, Bart., eminent physician and toxicologist, was born at Edinburgh on July 18th, 1797. He graduated in medicine at Edinburgh University in 1819, and subsequently studied in London and Paris. He was appointed to the chair of medical jurisprudence in Edinburgh in 1822, shortly after his return to Scotland, and in 1832 he was promoted to those of materia medica and clinical medicine, but resigned them in 1877 and 1855 respectively. He was twice president of the Royal College of Physicians, president of the Royal Society of Scotland, and ordinary physician to the Queen in Scotland. On the recommendation of Mr. Gladstone he was created a baronet in 1871, and in 1876 he declined the presidency of the British Association. He was D.C.L. of Oxford and LL.D. of Edinburgh, and was elected rector of the latter university in 1880. His death took place on Jan. 23rd, 1882. The most important of his published works is his Treatise on Poisons (1829), but he also wrote Granular Degeneration of the Kidneys (1839), and a commentary on the Pharmacopœias of Great Britain (1842).

CHRISTMAS ISLAND, the name given to three oceanic islands, of which the most important is situated about 250 miles s. by E. of Java Head, the western extremity of Java. This island, which is supposed to have been originally a coral atoll, and to have been raised by volcanic forces, rises to the height of nearly 1600 feet, and is in shape an irregular quadrilateral of about 30 miles in circumference, having an area of about 20 square miles. It is only very recently that it has been investigated, and as yet comparatively little is known of it, partly from the fact that it is densely covered with gigantic forest vegetation and bush. The most prominent members of its fauna are tree-climbing crabs and rats, which swarm in the island. It was annexed by Britain in 1888, and a settlement has been formed on it at the only tolerable landing-place, namely Flying Fish Cove, with the intention of exploiting the beds of natural phosphate, suitable for manure, that are found in the island. The climate is healthy, but for six months in the year landing is impossible, even at Flying Fish Cove, owing to the rocky and precipitous nature of the coasts.—Another Christmas Island, also belonging to Britain, is situated almost in the centre of the Pacific, a few degrees north of the equator and in about 150° w. longitude. It forms one of the Fanning Islands (which see in Supp.). The third island of the name is near Cape Breton.

CHRIST'S THORN, the *Paliurus aculeatus*, a small thorny shrub of the order Rhamnaceæ, with small shining ovate leaves and yellowish-green clustered flowers. It is common in the south-east of Europe and Asia Minor, and some suppose it to have been the plant from which the Jews platted the crown of thorns for our Saviour. See also Jujube.

CHROMATIC PRINTING. See Lithography.

CHROME GREEN, the green oxide or sesquioxide of chromium, forming a green pigment used by enamellers. It is also employed by dyers and calico-printers as a mordant. A hydrated variety, $Cr_2O_3.2\,H_2O$, used for the same purposes, is known as *Guignet's green* or *emerald green*. *Arnaudon's green* contains some phosphoric acid in addition. These are now used instead of the poisonous greens prepared from arsenic as a base. See Chromium.

CHROME YELLOW. See Chromium.

CHRONOGRAPH, the name given to various devices for measuring and registering very minute portions of time with extreme precision. Benson's chronograph is, in principle, a lever watch with a double seconds hand, the one superimposed on the other. The outer end of the lowermost hand has a small cup filled with a black viscid fluid, with a minute hole at the bottom, while the corresponding end of the uppermost is bent down so as just to reach the hole. At the starting (say) of a horse-race, the observer pulls a string, whereupon the bent end of the upper hand passes through the hole and makes a black mark on the dial, instantly rebounding. Again, as each horse passes the winning-post the string is redrawn and a dot made, thus marking the time of each horse. This chronograph registers to $\frac{1}{10}$ of a second. Strange's chronograph is connected with the pendulum of an astronomical clock, which makes a mark on a sheet of paper at the beginning and end of each swing. By touching a spring on the appearance (say) of a particular star on the field of a telescope, an intermediate dot is made, and by measuring the distance of this from either of the extremes, the exact time can be ascertained to $\frac{1}{100}$ of a second. Schultze's chronograph, in which electricity is applied, is yet far more precise, registering time to $\frac{1}{500000}$ part of a second.

CHUCK-WILL'S-WIDOW, a popular name in the United States for a bird of the goat-sucker family, *Antrostomus carolinensis*, so called from its cry. It is rather larger than the whip-poor-will, which it resembles in many ways. See Whip-poor-will.

CHURCHILL, Randolph Henry Spencer, Lord, third son of the seventh Duke of Marlborough, was born on Feb. 13th, 1849. He was educated at Merton College, Oxford, and after taking his master's degree he determined to devote himself to politics. Having entered parliament in 1874 as member for Woodstock, by 1884 he had risen to the position of a recognized leader of the Conservative party, and in 1885 became Indian Secretary in Lord Salisbury's government. His tenure of this office was rendered notable by the annexation of Upper Burmah. On the defeat of Gladstone's Irish Bill in 1886 Churchill became leader of the House of Commons and Chancellor of the Exchequer, posts which he unexpectedly resigned in December, 1886. His health latterly began to give way and he sought to restore it by voyages to South Africa and elsewhere, but in vain. He died in London on Jan. 24th, 1895, shortly after his return from Egypt. Lord Randolph Churchill was a brilliant though at times rather violent personality in British politics. His opinions were mainly Conservative, but he often found himself in opposition to the official leaders of that party; and for some time he acted as the leader of what was known as the Fourth Party, consisting of four members who adopted a somewhat independent position. His son, Winston Leonard Spencer, has served with distinction in the army, and has also gained some reputation as a writer.

CHURCHILL RIVER, a river of the North-west Territories of Canada, which rises in La Crosse Lake, forms or passes through various lakes or lake-like expansions, the largest being Big or Indian Lake, and enters Hudson's Bay near Fort Churchill, after a north-easterly course of about 800 miles. It is called also Missinippi or English river, and is navigable only by means of frequent portage.

CHURCHING OF WOMEN, a form of thanksgiving after child-birth, adopted from the Jewish ceremony of purification, and practised still in the Roman Catholic and Anglican Churches, the latter having a special service in the Prayer Book.

CHURCHYARD BEETLE, the *Blaps mortisaga*, a common British insect found in dark, damp, and dirty places. It is black, but little shining, and the tip of the elytra forms a short obtuse point. Another species of the genus, *B. sulcata*, is eaten with butter by Egyptian women.

CHUTIA NAGPUR. See Chota Nagpore.

CIBOL (*Allium fistulosum*), a perennial plant of the onion genus, a native of Siberia, with hollow stems larger than those of the chive. It was formerly cultivated in Britain for culinary use, but it has been superseded by more palatable species.

CICALA. See Cicada.

CICELY, a popular name applied to several umbelliferous plants. Sweet ciccly, or sweet chervil, is *Myrrhis odorata*, a sweet-scented plant fairly common though not native in Britain. It was formerly used in medicine, and in some parts of Europe is used as an ingredient in soups, &c. It has a hollow stem 2 or 3 feet high, with fine fern-like foliage. It is often popularly called myrrh.

CIGARETTE, a sort of small cigar made by rolling fine-cut tobacco in thin paper specially prepared for the purpose. The cigarette is of comparatively recent invention, and came into general use only of late years. At first they were manufactured exclusively by hand, but the increasing demand for them led to the invention of machines for performing the processes of rolling the paper into tubes and filling them with fine tobacco. The first of those machines, invented by a Frenchman, was exhibited in 1878: it has since undergone many improvements, so that now cigarettes can be turned out in enormous numbers at the rate of about a thousand per hour.

CILIA (Latin, 'eyelashes'), small, generally microscopic, hair-like organs or appendages, averaging $\frac{1}{3000}$ inch in length, found on the surface of the tissues of most animals, and in some vegetable organisms (as Volvox), chiefly on tissues which are in contact with water, or which produce fluid secretions. They are constantly in a state of active movement, and communicate to the fluid with which they are in contact a corresponding motion. This is called *vibratile* or *ciliary motion*. In most of the lower aquatic animals the respiratory function is aided by means of the vibratile cilia; many animalcules move by a similar mechanism; and in the highest classes of animals cilia have a share in the performance of some important functions.

CIMOLOS. See Argentiera.

CINEMATOGRAPH (Greek *kinēma*, *kinēmatos*, movement, from *kineō*, I move), an ingenious instrument introduced about 1895 by two brothers Lumière of Lyons, and founded on the same principle as Edison's *kinetoscope*. The most important part of the instrument is a sensitive photographic film or band about an inch and a quarter broad and some fifty feet long. This band passes over a drum of moderate size, then down and round a small one, which deflects it upwards towards another small drum, and after passing over this one it winds round another large drum in the centre of the instrument proper. Each portion of the film in the course of its motion passes vertically close behind an opening situated above the last three drums but below the first one. This opening does not communicate directly with the outside, but is placed in the partition dividing the part of the apparatus containing the last three drums from an adjacent part situated below that containing the first drum. Facing this aperture, and fixed in the opposite wall of that box which does not contain the three drums, is an objective through which light passes into the interior. Thus by means of a peculiar arrangement of eccentrics which secures that each portion of the film shall be stopped for an instant before the opening, about 15 photographs per second can be received on the film, each representing the photographed group at a different instant from the others. In order to transform these negatives into positives, the negative film is rolled back on to the first drum, and on a second similar drum below it in the same compartment of the apparatus another film is rolled. The two films are then unrolled simultaneously, and thus the light entering through the objective and the aperture imprints on the new film a positive impression of the scenes represented on the other one. The positive film is made to wrap itself round the drum in the lower part of the apparatus, whilst the negative one is made to pass off through the bottom. The positive film is now wound back on to the first drum, and the instrument is then ready to project the representations on a screen at some distance. To do this, lantern accessories are necessary, but beyond that all that is required is to unwind the positive film by means of the same mechanism as performed the previous operations. The screen receives enlarged representations of the successive film-photographs in the same order as that of taking, and separated by such small intervals of time as to cause the whole to blend and form apparently a continuous representation of a moving group during a fairly long period of time. The advantages of this mode of photographing and throwing pictures on a screen over the older methods are obvious. Movements too rapid to be analysed by the eye, can, by controlling the rate of working while they are being represented on the screen, be made slow enough to permit of their true nature being observed; and similarly, movements too slow for comprehension or rapid observation may often be, as it were, quickened. The busy life of a city street, the progress of races or other competitions, many scenes in nature, and even the growth of a plant from the seed to maturity, may by means of this instrument be shown to a large number within a convenient period of time. Still more remarkable, the succession of movements in any group may be reversed in the final representation, and we may thus see a plant growing downwards from flower to seed. Many similar instruments have been patented under a large number of names, many of them clumsy and some of them outrageous. Among the names are *kinetograph, photocinegraph, heliocinegraph, cinegraphoscope, eventograph, kinebleposcope, photopolygraph, photocinematograph, movementoscope, badizograph, pantamimograph, biograph,* and many others in which *graph, scope,* are attached to classical and nondescript roots. None of these instruments, however, shows its pictures altogether free from a peculiar trembling which seems to be due to almost unavoidable defects of workmanship, but this drawback may, perhaps, be ultimately removed.

CINERARIA, a genus of plants of the natural order Compositæ, consisting of herbs or small shrubs with small-sized heads of flowers. There are about 25 species, chiefly found in South Africa, but a number of varieties have been much cultivated in greenhouses and gardens, the most important being derived from *C. cruenta*, a native of Teneriffe, with crimson ray-florets. The Cinerarias are often regarded as belonging to the genus *Senecio*, to whose species they are closely related.

CINERARY URNS, urns in which the ashes of the dead were deposited after the body was burned. Many Greek and Roman urns are in a high style of art, and are formed of marble, glass, or pottery ware. See VASE.

CINGALESE. See CEYLON.

CINNAMOMUM, a genus of plants of the natural order Lauraceæ, natives of tropical Asia and the Polynesian Islands. There are some 50 species, all trees or shrubs with coriaceous, evergreen leaves and panicled flowers. All possess an aromatic volatile oil, and one of them yields true cinnamon, while others yield cassia. See CINNAMON and CASSIA.

CINQUE-FOIL, in architecture, an ornament in the Gothic style, consisting of five foliated divisions, often seen in circular windows. In heraldry, it means a five-petalled corolla borne without a stalk and full-faced. In botany, the cinque-foil is *Potentilla reptans*, a common yellow-flowered rosaceous plant closely allied to the strawberry. See POTENTILLA.

CIPPUS, in Roman antiquities, a low column generally rectangular and sculptured, and often bearing an inscription. They served as sepulchral monuments, as milestones and boundaries, and in some cases to receive the inscribed decrees of the senate. Cippi were frequently or usually adorned with rams' heads supporting festoons of flowers, figures of sphinxes, and various mythological subjects. Those serving as tombstones regularly bore such inscriptions as D.M. for *Dis Manibus*, and S.T.T.L. for *Sit tibi terra levis*.

CIRCENSIAN GAMES. See CIRCUS.

CIRCLEVILLE, a town of the United States in Ohio, on the Scioto river, 104 miles N.E. from Cincinnati. It is engaged in the pork trade, and among its manufactures are straw-board, shoes, agricultural implements, furniture, &c. Broom-corn is extensively grown in the vicinity. The name is derived from an old circular fortification in the neighbourhood. Pop. (1890), 6556.

CIRCULAR NOTES, notes or letters of credit furnished by bankers to persons about to travel abroad. Along with the notes the traveller receives a 'letter of indication' bearing the names of certain foreign bankers who will cash such notes on presentation, in which letter the traveller must write his name. On presentation of a circular note the foreign banker can demand to see the letter of indication, and by causing the presenter to write his name can compare the signature thus made with that in the letter, and so far satisfy himself as to the identity of the person presenting the note.

CIRCUMNUTATION (lit. 'a nodding round about'), a name given by Darwin to the continuous motion of every growing part of every plant, in which it describes irregular elliptical or oval figures. The apex of the stem, for instance, after pointing in one direction, moves round till it points in the opposite direction, and so on continuously.

CIRRHOSIS, a disease characterized by growth of fibrous tissue which gradually encroaches on and by compression destroys the true structure of the organ attacked. It is very frequent in the liver as a consequence of spirit-drinking; and hence the term 'drunkard's liver'. See ALCOHOLISM in SUPP.

CIRRUS (in plural CIRRI), the tendril of a plant by means of which it climbs, usually a modified leaf or the prolongation of a midrib. In the pea, the vetch, &c., the terminal leaflet of each leaf is usually represented by a tendril which enables the plant to climb or support itself. See CLIMBING PLANTS in SUPP., VETCH, PEA, and SWEET-PEA.

CISLEITHAN PROVINCES. See AUSTRIA.

CIST, a place of interment of an early or prehistoric period, consisting of a rectangular stone chest or inclosure formed of rows of stones set upright, and covered by similar flat stones. Such cists are found in barrows or mounds, inclosing bones. In rocky districts cists were sometimes hewn in the rock itself.

CISTUS, the rock-rose, a genus of plants of about 20 species, type of the order Cistaceæ, natives of Europe, or of the countries bordering the Mediterranean. Some of them are beautiful evergreen flowering shrubs, ornamental in gardens or shrubberies. Gum ladanum is obtained from *C. creticus*, and *C. ladaniferus*. The common wild rock-rose found growing on hillsides, dry banks, &c., belongs to the allied genus *Helianthemum* (*H. vulgare*). Both genera are characterized by simple, opposite, lanceolate leaves and usually rose-like flowers, but they differ in the ovaries and fruit.

CITATION, a summons or official notice given to a person to appear in a court as a party or witness in a cause. In England the word has reference chiefly to the spiritual, probate, and matrimonial courts. In Scotland, citations are either delivered personally, by giving a copy of the summons to the person sought, or by delivering a copy at his house, or by registered letter, or, lastly, by handing it to the keeper of edictal citations at the Register House in Edinburgh, this last method being resorted to when a person is not resident in Scotland. See Summons.

CÎTEAUX, a village of Eastern France, in the department of Côte-d'Or, 14 miles from Dijon. See Cistercians.

CITRON, *Citrus medica*, a small evergreen shrub introduced into the southern parts of Europe from Asia, and yielding a fruit which is candied with sugar. The rind is considered superior to the pulp. The juice is less acid than that of the lemon. See Citrus.

CITRONELLA OIL, an oil obtained from a kind of grass (*Andropogon Nardus*), cultivated at Singapore and in Ceylon. It is used for scenting soap. Other species of the same genus and some other allied genera also yield essential oils.

CITRULLUS. See Colocynth and Melon.

CITTERN. See Cithern.

CIUDAD BOLIVAR. See Angostura.

CIUDAD DE CURA, a town of Venezuela, 25 miles in a south-westerly direction from Caracas, near Lake Valencia. Pop. (1888), 12,198.

CIVE. See Chive.

CLAIRE, St., or Santa Clara, Order of, a religious order founded in 1212 by a lady of this name, of noble birth, who was born at Spoleto, Italy, about 1193, and died in 1253, being canonized two years after her death. She came under the influence of St. Francis of Assisi, and it was on his advice that she became a nun despite the wishes of her parents. The order is divided into a severe sect, the Damianists, who adhere to the original vows in their entirety, and a more moderate sect, the Urbanists, who follow the rules as relaxed first by Alexander IV., and afterwards by Urban IV. It has numerous convents in Europe and America.

CLAM, the popular name of certain bivalvular shell-fish of various genera and species, *e.g.* the thorny clam (*Chama Lazarus*), the yellow clam (*Tridacna crocea*), the giant clam (*T.* or *Chama gigas*), the common clam of the United States (*Mya arenaria*), &c. The giant clam has the largest shell known, and the animal is used as food in the Pacific. The common United States clam is also much used for food.

CLARA, Santa. See Claire in Supp.

CLARE, John, the Northamptonshire peasant poet, was born on July 13th, 1793, at Helpstone, near Peterborough, where his father was a farm-labourer. He led a rambling, unsteady life until 1818, when he was obliged to accept parish relief. In 1821 his Poems Descriptive of Rural Life and Scenery met with a favourable reception, and the issue of his Village Minstrel later in the same year won him many friends. A subscription furnishing him with £45 annually was, however, dissipated by 1823, and his Shepherd's Calendar (1827), which he hawked himself, was not a success. He brought out a new work, the Rural Muse, in 1835, but became insane shortly afterwards, and the remainder of his life, from 1837 to 1864, was passed in the Northampton Lunatic Asylum. Clare was a genuine poet, and his pictures of rural life are eminently truthful and pleasing.

CLARENCIEUX. See King of Arms.

CLARKE, Charles Cowden, English writer, was born at Enfield, Middlesex, on Dec. 15th, 1787. His father kept a small school there, and had John Keats as one of his pupils; but in 1810 he gave it up and removed to Ramsgate. The son frequently went up to London, where he came into contact with Leigh Hunt, Shelley, Hazlitt, the Lambs, and Vincent Novello, and in 1828 he married the eldest daughter of Novello. He engaged for some time in business as a bookseller and a music publisher, and from 1834 till 1856 he lectured throughout the country mainly on poets and poetry. He died at Genoa on March 13th, 1877. His publications include his Hundred Wonders (1814); Adam the Gardener (1834); Shakespeare Characters, chiefly those subordinate (1863); and Molière Characters (1865), the two last being collections of some of his lectures. He is best known, however, by the edition of Shakespeare which he annotated in conjunction with his wife, and by the Shakespeare Key (1879).—Mary Cowden Clarke, was born in 1809, and died on Jan. 12th, 1898. Her best-known work is her Concordance to Shakespeare, published in 1845, which cost sixteen years' labour. Other works from her pen are The Girlhood of Shakespeare's Heroines (1850); World-noted Women (1857); and several stories and novels, including The Adventures of Kit Bam, Mariner (1848); The Iron Cousin (1854); Trust and Remittance (1873); and A Rambling Story (1874). See Mrs. Clarke's memoir of her husband (1887), and her Autobiographic Sketch (1896).

CLARY (*Salvia Sclaræa*), a plant of the *Salvia* or sage genus, used for flavouring soups and confectionery. Its flowers were formerly used with brandy, sugar, cinnamon, and a little ambergris to make *clary water*, regarded as a cardiac to help digestion.

CLASSIFICATION. See Class.

CLAYCROSS, a town of England, in Derbyshire, about 4 miles s. of Chesterfield, in a coal and iron district. Pop. (1891), 7727.

CLAYMORE, formerly the large two-handed, double-edged sword of the Scotch Highlanders; now a basket-hilted, double-edged broadsword.

CLAY-SLATE. See Slate.

CLAYTON-BULWER TREATY, a treaty between Britain and the United States concluded in 1850, and having reference to the construction of a ship canal across the Isthmus of Panama and to the dual control of such a shipway. Both parties agreed not to erect fortifications here, nor to acquire any part of the Central American territory. This treaty received its designation from the two diplomatists who negotiated it—Mr. J. M. Clayton for America and Sir Henry Lytton Bulwer for Britain. The provisions of the treaty having been differently construed by the two nations, this in 1900 led to a new agreement by which the United States acquired much more liberty of action.

CLEARING-NUT (*Strychnos potatorum*), a small tree of the same genus as the nux vomica, common in Indian forests. Its seeds being rubbed on the inside of a vessel containing turbid water speedily precipitate the impurities, this result being due it is said to the clarifying effect of the albumin and casein they contain.

CLEAR-STORY. See Clere-story.

CLEATOR MOOR, a town of England, in Cumberland, 4 miles s.e. of Whitehaven. It owes its existence to the discovery and opening up of the immense beds of iron ore in the district. There are extensive foundries, boiler-works, &c. Pop. (1881), 10,420; (1891), 9464.

CLEAVERS, Clivers, or Goose-grass (*Galium*

Aparine), a common species of the bedstraw genus of plants, of the order Rubiaceæ, with hispid stem, leaves, and fruit, common in hedges and among bushes in Britain and other parts of Europe. The leaves are set at intervals along the stem in whorls of from six to nine, and the small flowers are axillary. It is called cleavers from the readiness with which it adheres to a person's clothes, and goose-grass because geese are said to be fond of it. See BEDSTRAW.

CLEG, a name applied to various insects which are troublesome to horses, cattle, and even to man from their blood-sucking propensities. Such are the great horse-fly, gad-fly, or breeze (*Tabanus bovinus*, the *Chrysops cæcutiens*, and the *Hæmatopota pluvialis*), for the first of which see GAD-FLY. *Chrysops cæcutiens* is a yellow-marked black insect, rare in Scotland, but common in England, where it is a great nuisance to man. *H. pluvialis*, a frequenter of damp places, like the preceding insect, has the large eyes of the Tabanidæ. It is grayish in colour and a common pest in Scotland.

CLEMENS, SAMUEL LANGHORNE, an American humorist, more generally known by his pseudonym 'Mark Twain', was born at Florida, in Missouri, on Nov. 30th, 1835. He received only a scanty school education, and in 1848 became apprentice to a printer, subsequently working at this trade in Philadelphia, New York, and elsewhere. He afterwards learned the business of pilot on the Mississippi, but left this occupation to become secretary to his brother, who had been appointed secretary of Nevada Territory. He then tried his fortune at the Nevada mines. In 1862 he became local editor of a newspaper in Virginia City, but soon went to San Francisco, where he was for some time a reporter. After meeting with non-success in the Calaveras gold-diggings he returned to journalism in San Francisco. In 1866 he went to the Sandwich Islands, and on his return commenced his lecturing career. A trip to the Mediterranean, Egypt, and Palestine followed. He edited for a time a paper in Buffalo, and thereafter married and settled in Hartford, Conn. He has travelled widely, and many of the scenes and incidents in his works are drawn from his journeys. He lost heavily through the failure of a publishing house which he founded in 1884. Latterly he has lived a good deal in Europe. His chief books are The Jumping Frog, &c. (1867); The Innocents Abroad (1869); Roughing It (1873); Adventures of Tom Sawyer (1876); A Tramp Abroad (1880); Life on the Mississippi (1883); Huckleberry Finn (1885); A Yankee at the Court of King Arthur (1889); The American Claimant (1892); Tom Sawyer Abroad (1894); Joan of Arc (1896); and More Tramps Abroad (1897).

CLEMENT, CLEMENS ROMANUS, or *Clement of Rome*, one of the 'Apostolic Fathers', is said to have been the second or the third successor of Peter as bishop of Rome, and the first of the numerous popes named Clement. He is perhaps identical with a consul named Flavius Clemens, put to death under Domitian, A.D. 95. Various writings are attributed to him, but the only one that can be regarded as genuine is an Epistle to the Corinthians, first obtained in a complete form in 1875 from a manuscript recently discovered. It is of importance as exhibiting the first attempt of the Church of Rome to exercise ecclesiastical authority over other churches. See Apostolic Fathers (1891) by the late Bishop Lightfoot.

Cleopatra's Needle.—London.

CLEOPATRA'S NEEDLES, the name given to two obelisks, formerly at Alexandria, one of which is now in London, the other in New York. They are made of the rose-red granite of Syene, and were originally erected by the Egyptian king Thothmes III., the most celebrated king of the eighteenth dynasty, in front of the portico of the great temple of Heliopolis, the On of the Scriptures and the place where Moses was born and brought up. From Heliopolis the two obelisks were removed to Alexandria not long before the commencement of the Christian era, but not, so far as we can now tell, during the lifetime of Cleopatra. We are at least informed by an inscription on the bronze supports of one of them, that they were not erected at Alexandria till the eighth year of the reign of Cæsar (that is, Augustus Cæsar), and accordingly seven years after the death of Cleopatra. How, then, they came to be called Cleopatra's Needles is not apparent; but it may be conjectured that they had been removed by her order some time before they were set up on their second site, or that their removal was the carrying out of an intention formed by Cleopatra. Mr. (afterwards Sir) Erasmus Wilson, to whom the credit may be awarded of having been chiefly instrumental in getting the British obelisk conveyed to London, assumes that the association of Cleopatra's name with the two obelisks represents the popularity of the queen and the affectionate regard of her subjects, rather than any participation of herself in their transport or erection. The obelisk now at London lay for a long time prostrate in the sand. In 1820 it was presented by Mehemet Ali to the British nation; but the British government, in spite of many appeals made to them on the subject, never did anything for its removal, which was at last effected solely through the public spirit of several private individuals, the obelisk being erected on the Thames Embankment in 1878. The other obelisk was presented to the United States by the Khedive of Egypt, and was transported to New York, where it was erected in 1881. The one in

London is somewhat the taller of the two, being 68 feet 5½ inches in height, as against 67 feet 2 inches, the height of the other. The lateral measurements at the base are, in the British obelisk, 7 feet 5 inches in one pair of opposite sides, and 7 feet 10½ inches in the other pair; in the one now in New York, 7 feet 9¾ inches, and 8 feet 2¼ inches. The weight of the British obelisk is rather more than 186 tons, and its mass 2529 cubic feet. Both obelisks are inscribed with hieroglyphs, which are often engraved to a depth of several inches and carefully polished, so that the work is comparable, according to Sir E. Wilson, to the delicate carving of a gem. The hieroglyphs cover all the four sides of the British obelisk. They are inscribed in vertical columns, which are read from the top downwards; and in each case the middle column is in honour of Thothmes, by whom the obelisks were first erected, and the side columns in honour of Rameses II., the most celebrated king of the succeeding dynasty, who reigned at least two hundred years after Thothmes. On each side of the pyramidion, or small pyramidal top of the obelisk, is a bas-relief representing the sun-god, protector of the city of Heliopolis, receiving gifts from Thothmes. See Cleopatra's Needle, &c., by Erasmus Wilson, F.R.S.

CLEVELAND, a hilly district in the North Riding of Yorkshire, about 28 miles long and 15 broad, between the Tees and the coast at Whitby, forming one of the parliamentary divisions of the county. It has developed enormously since the discovery of its extensive deposits of iron ore, which is smelted chiefly at Middlesbrough.

CLEVELAND, Grover, twenty-second president of the United States, was born at Caldwell, New Jersey, on March 18, 1837. After some time in New York and elsewhere he settled in Buffalo, and having acquired an excellent position as a lawyer was elected mayor in 1881. He had previously filled the office of sheriff of Erie county for three years. Next year he was elected by the democrats governor of New York State, and in 1884, having been nominated for the presidency by the Democratic national convention at Chicago, was elected on Nov. 4. Civil service reform and tariff reform were advocated by him during his tenure of office, which came to an end in 1889. President Harrison then succeeded, but Cleveland was again elected president in 1892 by a very large majority over Mr. Harrison. At the election of 1896 Mr. Cleveland was succeeded by Mr. W. J. Bryan as Democratic candidate. The issue was a monetary one, and the poll resulted in the return of Mr. M'Kinley, the Republican monometallist.

CLEW BAY, a bay on the west coast of Ireland, in county Mayo, containing a vast number of islets, many of them fertile and cultivated.

CLICHÉ, an electrotype or a stereotype cast from an engraving, especially from a woodcut.

CLICK-BEETLE. See Elater.

CLIFFORD, William Kingdon, English mathematician, was born at Exeter on May 4, 1845. Educated in his native town and at King's College, London, he proceeded to Trinity College, Cambridge, where he graduated in 1867 as second wrangler. In 1871 he was appointed professor of applied mathematics at University College, London, a post which he held till his death. In 1876 his health gave way, but was restored by a summer spent in Spain and Algiers, though not permanently, for two years later he again broke down, and died soon afterwards at Madeira, March 3, 1879. In mathematics his teachings and writings are regarded as marking an epoch in the history of the science in England. His Canonical Dissection of a Riemann's Surface, his theory of Biquaternions, and his memoir On the Classification of Loci, may be mentioned as his most important contributions to this subject. He also wrote on philosophical subjects. Amongst his works the most important are: Elements of Dynamic (vol. i. on Kinematic, 1878); Seeing and Thinking (Nature Series, 1879); and Common Sense of the Exact Sciences (1885, completed by Professor Karl Pearson). In 1882 appeared a collection of his Mathematical Papers edited by Mr. R. Tucker, and in 1879 Mr. Leslie Stephen and Mr. Pollock edited his Lectures and Essays. Mrs. W. K. Clifford has written several novels and stories, the chief being Mr. Keith's Crime (1885).

CLIMBING PLANTS are plants of weak stems which naturally seek support from their surroundings to rise from the ground. Some are twining plants, rising by winding themselves or their tendrils (*cirri*) round the trunks of trees, &c. Such are the honeysuckle, scarlet-runner, hop, bindweed, &c. Others, like the ivy, attach themselves by small roots developed from the stem as they ascend. Some in climbing always twine spirally from right to left, others again always take the opposite direction.

CLINK-STONE, grayish felspathic rock of the trachytic group, with a slaty structure, and generally divisible into tabular masses that are sometimes used as roofing slates. It is so named from its sonorousness.

CLINOMETER, an instrument used for taking the dip and strike of rock strata. In its commonest form it consists of a sort of protractor with a pendulum attached. When the clinometer lies horizontally the indicator points to 0°, and when inclined the amount of inclination is shown at once by the pendulum. It is most convenient to combine compass and clinometer in one instrument.

CLINTON, a town of the United States, in Iowa, on the Mississippi, 42 miles above Davenport, with railway workshops, foundries, &c. A railway bridge crosses the river here. Pop. (1890), 13,619.

CLIO, a genus of pteropodous molluscs of which one species, *C. borealis*, is extremely abundant in the northern seas, constituting the principal part of the food of the whale, and hence often called *whale's food*. *C. papilionacea* is occasionally seen off the eastern coast of North America. See Mollusca.

CLOGHER, a village and old episcopal see of Ireland in county Tyrone, 15 miles south-east of Omagh, with cathedral and bishop's palace. The see, of which St. Patrick is said to have been the first bishop, is united with that of Armagh. Pop. (1891), 273.

CLONAKILTY, a seaport of Ireland, in county Cork, at the head of Clonakilty Bay, 27 miles south-west of Cork, with a considerable trade in grain. It has mills for corn and flax. Pop. (1891), 3221.

CLONTARF, a town of Ireland, in county Dublin, on the northern shore of Dublin Bay, some 3 miles E.N.E. of Dublin. It is a much-frequented watering-place, and is historically interesting as the scene of Brian Boroimhe's victory over the Danes in 1014. Pop. (1891), 5104.

CLOSURE (in its French form, *Clôture*) is a rule in British parliamentary procedure adopted in 1887 for the purpose of preventing a continuance of unnecessary debate by a minority. The rule is, that any member, after obtaining the consent of the speaker, may move 'that the question be now put'. This motion must be supported by more than 100 members and opposed by less than forty, or have the support of 200 members; in which case the question is immediately put to the House and decided without further debate. So also, if a clause of a bill is under debate, a motion that it stand or be added may be put and carried in the same way. In the American House of Representatives the same object is secured by moving the previous question.

CLOTHES-MOTH, the name common to several moths of the genus *Tinea*, whose larvæ are destructive to woollen fabrics, feathers, furs, &c., upon which they feed, using at the same time the material for the construction of the cases in which they assume the chrysalis state. See Moth for preventives, &c.

CLOTHO. See Fates.

CLOVE-GILLYFLOWER, or Clove-pink, the carnation (*Dianthus Caryophyllus*), more especially a whole-coloured, clove-scented variety of it.

CLOVER-WEEVIL, a kind of weevil, of the genus *Apion*, different species of which, or their larvæ, feed on the leaves and seeds of the clover, as also on tares and other leguminous plants. *A. apricans*, of a bluish-black colour and little more than a line in length, is especially destructive. See Weevil.

CLUBBING, a diseased condition of plants of the cabbage group (genus *Brassica*) produced by the larvæ of insects, consisting in the lower part of the stem becoming swollen and misshapen. Plants on ground exhausted by over-cultivation suffer chiefly. See Anbury in Supp. and Cabbage-fly.

CLUB-FOOT (Lat. *Talipes*), a congenital distortion of the foot, of which there are several varieties. Sometimes the foot is twisted inwards (*T. varus*); sometimes the heel is raised and the toes only touch the ground (*T. equinus*); sometimes the foot is twisted outwards (*T. valgus*); or it rests only on the heel (*T. calcaneus*). The deformity consists at first in the contraction of the muscles and tendons of the feet, but ultimately the bones become distorted. If attended to in time, the foot may be gradually coaxed to its natural shape, and even in more advanced cases the deformity is usually curable by modern surgery.

CLUB-MOSS, the common name of the plants of the order Lycopodiaceæ, or more particularly of the genus Lycopodium. See Lycopodiaceæ.

CLUNES, an important gold-mining town in the Australian colony of Victoria, county Talbot, 123 miles north-west of Melbourne. It has a public library, several churches and schools, a hospital, and excellent waterworks. Pop. (1891), 3213.

CLUNIACS. See Cluny.

CLUPEIDÆ, the herring family, the typical genus being *Clupea*, the herring, a family of fishes which includes the herring, sprat, pilchard, &c. (which see).

CLUTHA, the largest river of New Zealand, in the southern part of the South Island. It receives the waters of Lakes Hawea, Wanaka, and Wakatipu, and flows in a s.e. direction through the counties of Vincent and Tuapeka, and then between those of Clutha and Bruce, till it reaches the sea in Molyneux Bay, after a course of 150 miles.

COACH-DOG, a short-haired dog of moderate size and rather handsome shape, white with numerous black spots, kept as an attendant upon carriages, and of no use otherwise. It is called also the Dalmatian dog.

COAITA (*Ateles paniscus*), one of the largest of the South American monkeys, belonging to those known as spider monkeys, black in colour, and very docile in captivity.

COALBROOKDALE, an English coal and iron producing district in Salop, along the bank of the Severn, containing also limestone deposits. It is named from the village of Coalbrookdale, situated about 12 miles s.e. of the county town, Shrewsbury. The coalfield is gradually becoming exhausted.

COAL-FISH, a species of the cod genus (*Gadus carbonarius*), named from the colour of its back. It grows to the length of 2½ feet, and is found in great numbers about the Orkneys and the northern parts of Britain. In Scotland it is generally known as the *Sethe* or *Seath*, and is used as an article of food.

COALING STATIONS, ports in convenient positions for supplying steam-vessels, especially those of the navy, with coals when on service away from the home country. Britain possesses a number of such stations, among which may be mentioned Gibraltar, Malta, Aden, Bombay, Colombo, Trincomalee, Singapore, and Hong-Kong, in connection with the route by the Suez Canal to India, Australia, and the East; Gibraltar, Sierra Leone, St. Helena, Cape Town, and Mauritius, on the route to India and Australia, by way of the Cape; St. Lucia and Jamaica, in the West Indies; Esquimault, in Vancouver Island, &c. To a nation like Britain, with an enormous amount of property constantly on the sea, and with possessions in every quarter of the world, it is of the utmost importance that there should be convenient stores of coal for her men-of-war in the event of war breaking out; and it is equally necessary that these stores should be defended by suitable fortifications in order to prevent them from becoming the prey of hostile cruisers. Much accordingly has been done in recent years in fortifying these stations and providing them with heavy guns, as well as for establishing new stations at points where such are judged necessary, among which may be mentioned St. George's Sound, in the south-west of Australia, and Torres Straits. Land fortifications are deemed the proper defence of such ports, and not stationary war vessels; since the principal duty of the commander of a naval force is to meet a hostile squadron wherever it can be found, and not by dividing his ships in the different ports to give the enemy the command of the sea and the power of attacking him separately. He has a right to expect that the principal ports shall be protected by land forces and batteries, either afloat or on shore, sufficiently strong to protect them against an ordinary cruising squadron, and by sending it off to give him a better chance of intercepting it. The stations on the routes by way of the Suez Canal and the Cape to India, the Australian colonies, and the eastern seas are evidently of the greatest importance to Britain, though those on the American side are also necessary to furnish a base of operations to her warships in that quarter. For the Mediterranean fleet Gibraltar and Malta are indispensable as bases, and their defensive works and appliances were probably never at so satisfactory a condition as at present. Aden is a sort of second Gibraltar, keeping watch at the entrance (or exit) of the Red Sea, and its natural capacity for defence is now being greatly added to. Singapore has recently constructed several forts for its own defence at its own cost, the imperial government supplying the guns and ammunition; and there is here a considerable force kept up locally. Hong-Kong and the chief Australian ports have also been attending to their own defences, and making provision for repelling the attacks of enemies in the event of war. The total number of men required to properly garrison all the coaling stations abroad in war-time is estimated at 35,000, besides a reserve of 15,000 at home.

COAL-MEASURES, the upper division of the Carboniferous system, consisting of beds of sandstone, shale, &c., between which are coal-seams. See Geology.

COAL-PLANTS, such plants as have by their remains formed coal, chiefly allied to the ferns, lycopods, and horse-tails. See Coal.

COANZA, a large river of Angola, in Southern

Africa, entering the Atlantic near 9° 10′ s., a few miles south of St. Paul de Loanda. It flows at first in a north-easterly direction, then northwards for a considerable distance, and finally in a more or less westerly direction. In the lower part of its course there are many falls, the last being the Livingstone or Cambambe Falls, below which for a distance of about 170 miles the river is navigable for small steamers. Its total length is about 890 miles.

COATI, or Coati-mondi, a name of South and Central American plantigrade carnivorous mammals, of the genus *Nasua*, belonging to the Ursidæ or bears, but recalling rather the racoon or civets, and having a long proboscis or snout. They are about 20 inches in length, and have short legs and reddish fur. They feed on worms, insects, and the smaller quadrupeds, but chiefly on eggs and young birds. There are two species, namely, *N. rufa*, found throughout South America, and *N. narica*, found in Central America and Mexico.

COBALT-BLUE, or Thenard's Blue, a compound of alumina and oxide of cobalt, forming a beautiful pigment often used in the arts. Sometimes it contains also the phosphate or arsenate of cobalt, according to the mode of manufacture employed. It is non-poisonous, and unacted on by acids and alkalies.

COBALT-GREEN. See Rinmann's Green.

COBBE, Frances Power, authoress, was born near Dublin on Dec. 4, 1822, and educated at Brighton. She has taken a deep interest in many humanitarian movements, especially in the anti-vivisection crusade, and for eighteen years she acted as honorary secretary of the Victoria Street Society for the Protection of Animals from Vivisection. Some of her works are descriptions of her Travels in Italy, Greece, Egypt, and Palestine, the others treating mainly of theological, religious, and humanitarian questions. The most important are: Essay on Intuitive Morals (1855); Pursuits of Women (1863); Broken Lights: an Inquiry into the Present Condition and Future Prospects of Religious Faith (1864); Darwinism in Morals (1872); The Hopes of the Human Race Hereafter and Here (1874); The Peak in Darien (1882); The Scientific Spirit of the Age (1888); and The Modern Rack (1889). She has also written an enormous number of pamphlets.

COBOURG, a port of Canada, in the province of Ontario, Northumberland county, on the north shore of Lake Ontario, 69 miles E. by N. of Toronto. It is well built, has sundry manufactures, a good harbour, and an increasing trade. Pop. (1891), 4829.

COBURG, a thin fabric of worsted and cotton, or worsted and silk, twilled on one side, for ladies' dresses, intended as a substitute for merino.

COCA (*Erythroxylon Coca*), a shrubby plant belonging to the natural order Erythroxylaceæ, found wild in the mountainous regions of Peru and Bolivia, and cultivated in districts 2000 to 5000 feet above sea-level. The leaves are gathered and dried in the sun, and chewed with a little powdered chalk. When taken in some quantity they produce an intoxication like that of opium. As the indulgence is repeated the appetite for it increases, while that for wholesome nourishment diminishes; the miserable victim loses all power of resisting his craving, and becomes reduced to a condition of physical and mental prostration. When used in moderation coca lessens the appetite for food and enables those who have partaken of it to sustain greater fatigue than they otherwise could. It has been found the best preventive of asthmatic symptoms caused by the rapid ascent of lofty mountains. An infusion of the leaves is also used with the same effect. See next article.

COCAINE ($C_{17}H_{21}NO_4$), an alkaloid obtained from the leaves of the shrub *coca* described in the preceding article. It forms colourless transparent prisms, has a bitter taste, no smell, and is readily soluble in ether. It possesses the power of abolishing the sensibility of the skin and mucous membranes, so that when a solution is applied to the tongue or the eye sensation is abolished in a few minutes, and an operation can be conducted without pain. Sensation returns again after a few hours. Care must be employed in the use of this drug (which in a liquid extract is given to produce sleep), because, when taken in too large doses, it is poisonous. Too large a dose produces giddiness, headache, and delirium, while death may result from stoppage of breathing. In such a case stimulants are the appropriate remedy.

COCCINELLA, the lady-bird genus of insects. See Lady-bird.

COCCOLITE. See Augite.

COCCO ROOT, or Coco or Cocoa Root, the name for the corms of several plants of the genus *Colocasia* (order Araceæ), used as food in tropical America and India. Like the other plants of the order, which is represented in Britain by the common arum, the flowers are arranged in a spadix inclosed in a large spathe. *C. antiquorum* is cultivated for the sake of its leaves, which, when deprived of the acridity characteristic of the order, are used like spinach. The rootstocks of *C. esculenta* and *C. macrorhiza* are similarly used. Some of the species are cultivated in hot-houses as ornamental plants. See Colocasia in Supp., and Tara.

COCCOSTEUS, a genus of fossil fishes mainly of the Old Red Sandstone, having small berry-like tubercles studding the plates of their cranial buckler and body. It differs from Cephalaspis in having its back and belly both covered with a cuirass.

COCHINEAL-FIG, a name given to *Opuntia coccinellifera* and two other species of cacti, natives of Mexico and the West Indies, the plants on which the cochineal insect lives. See Cochineal and Cactus.

COCKLE-STOVE, a stove in which the fire-chamber is surrounded by air-currents, which, after being heated sufficiently, are admitted into the apartments requiring to be warmed.

COCK OF THE PLAINS (*Centrocercus urophasianus*), a large North American species of grouse, inhabiting desolate plains in the western states. See Grouse.

COCKSPUR-THORN, the *Cratægus crus-galli*, a North American shrub of the hawthorn genus, which has long been cultivated in Britain as a shrubbery ornament. There are several varieties, which are admired for their snowy blossoms in May.

COCOA-PLUM, the fruit of *Chrysobalanus Icaco*, belonging to the family Rosaceæ, which is eaten in the West Indies. It is about the size of a plum, with a sweet and pleasant though somewhat austere pulp. The root, bark, and leaves of the plant are employed as remedies in diarrhœa and other troubles. It has simple, alternate leaves and cymose flowers.

COCOS ISLANDS. See Keeling Islands.

COCUM-BUTTER, Cocum-oil, a pale, greenish-yellow solid oil got from the seeds of *Garcinia purpurea*, a tree of the same genus with mangosteen, used in India to adulterate ghee or fluid butter. It is sometimes mixed with bear's-grease in pomatums.

CODILLA, the coarsest part of hemp, which is sorted out by itself. This term is also applied to the coarsest part of flax.

CODLIN, Codling, a name for several varieties of kitchen apple with large or medium-sized fruit.

COEL. See Aligarh.

CŒLESTIN. See Celestine (mineral).

COFFEE-BUG (*Lecanium coffeæ*), an insect of the Coccus family (Coccidæ), very destructive in coffee plantations.

COG-WHEEL, a wheel with cogs or teeth. The pitch of such a wheel is the distance, measured along the pitch-line (explained below), between the centres of two successive teeth. The pitch-surface is an imaginary smooth surface between the tops and bottoms of the teeth, which is such that the velocity-ratio which would be produced by rolling contact with the pitch-surface of another toothed wheel would be the same as that actually produced by the action of the cogs. The pitch-circle (or pitch-line) of circular wheels is a section of the pitch-surface made by a plane perpendicular to the surface and to the axis of the wheel. The distance from the centre of the wheel to the pitch-line is the primitive radius, that from the centre to the crest of the cog being the true radius. The face of a cog is its outer surface, and the space between two adjacent teeth is the interdental space. Various kinds of toothed wheels are in use, such as the spur-wheel, the crown-wheel, and the bevel-wheel. See Wheelwork, Mechanism.

COHOES, an important manufacturing town of Albany county, in the state of New York, at the confluence of the Hudson and Mohawk rivers, and on the right bank of the latter, the picturesque Cohoes Falls, which furnish water-power, being situated just above the town. The chief manufactories are cotton-mills, knitting mills for the manufacture of hosiery, rolling-mills, foundries, machine-shops, manufactories of knitting-needles, pins, &c. Pop. in 1890, 22,509.

COLD-BLOODED ANIMALS. See Temperature of Animals.

COLENSO, John William, D.D., bishop of Natal, son of a gentleman who long held office under the Duchy of Cornwall, was born 24th January, 1814. He became a student of St. John's College, Cambridge, and in 1836 graduated as second wrangler and second Smith's prizeman, afterwards becoming fellow and assistant-tutor of his college. He was assistant-master at Harrow from 1838 till 1842, resided at St. John's College from 1842 till 1846, when he was preferred to the rectory of Forncett St. Mary, Norfolkshire, and on the 20th November, 1853, was appointed the first bishop of Natal. His numerous writings extend over a wide field. His treatises on arithmetic and algebra have become text-books in our schools and universities. In 1853 he published a collection of Village Sermons, in 1855 an edition of the Communion Service with Selections from the Writings of the Rev. F. D. Maurice, and in 1861 a Translation of the Epistle to the Romans Commented on from a Missionary Point of View. In the following year public attention was widely attracted by the first part of his work on the Pentateuch and Book of Joshua Critically Examined, in which the historical accuracy and Mosaic authorship of those books were called in question. This work was condemned as heretical by slight majorities in both Houses of Convocation of the province of Canterbury in 1864, and Colenso was declared to be deposed from his see by his Metropolitan, the Bishop of Cape Town. The deposition was, however, declared null and void on appeal to the Privy Council in March, 1865. Notwithstanding this decision the prelates forming the Council of the Colonial Bishoprics Fund refused to pay him his income, and he appealed to the Court of Chancery. The Master of the Rolls delivered judgment on 6th October, 1866, ordering the payment in future of his income, with all arrears and interest, but declaring that if his accusers had refused payment on the ground of heretical teaching he should have felt it his duty to try that issue, an offer which they declined to accept. One of the results of this ecclesiastical quarrel was that the Anglican community at the Cape was divided into two hostile parties; Colenso still remained the only bishop of the Church of England in Natal, but the Rev. W. K. Macrorie was consecrated Bishop of Maritzburg for the Church of the Province of South Africa, June 25, 1869. About the end of 1874 Colenso visited England to consult the heads of the church as to the relation of the diocese of Natal to the new see of Cape Town and on other matters. During this visit he pleaded before the secretary for the colonies and other members of the government the cause of Langalibalele, a Zulu chief who had been dispossessed of his territory and imprisoned at Cape Town. From that time forward the humane bishop was foremost in advocating the cause of the aboriginals against the oppression of the Boers and the encroaching policy of the Cape officials supported by Sir Bartle Frere. The captive Cetewayo (see Zululand) appealed to Colenso to place his case before the English people, and it was mainly owing to the bishop's efforts that the Zulu king was allowed to come to England to plead his own cause with the ministry. In the meantime Colenso continued his literary labours. The New Bible Commentary by the Bishops and other Clergy of the Anglican Church Critically Examined was published in 1871, the seventh and last part of his work on the Pentateuch in 1879, and Lectures on the Pentateuch and Moabite Stone in 1873. He died at his residence, Bishopstowe, Natal, on the 20th of June, 1883. See the Life by Sir G. W. Cox (1888).

COLERIDGE, John Duke Coleridge, Lord, Lord Chief Justice of England, was born in 1821, being the eldest son of Sir John Taylor Coleridge, judge, who was a nephew of Samuel Taylor Coleridge. Educated at Eton and Balliol College, Oxford, he graduated as B.A. in 1842, and was elected to an open fellowship of Exeter College in the following year. He proceeded M.A. in 1846, and in the same year the tenure of his fellowship ceased owing to his marriage. Called to the bar at the Middle Temple in November of that year, he went the Western Circuit, of which he soon became the leader. In 1855 he was appointed to the recordership of Portsmouth, six years later he became a Queen's Counsel, and soon afterwards he was chosen a bencher of the Middle Temple. From 1865 till 1873 he represented Exeter in the House of Commons as a Liberal, and in 1868 he became solicitor-general under Mr. Gladstone, being at the same time accorded the honour of knighthood. Three years later he became attorney-general, and in 1873, after declining the Mastership of the Rolls, he was appointed Chief Justice of the Court of Common Pleas. In the same year he was raised to the peerage as Baron Coleridge of Ottery St. Mary, and in 1880 he succeeded Sir Alexander Cockburn as Lord Chief Justice of England. He died in London on June 14th, 1894. Lord Coleridge distinguished himself very highly when acting as chief counsel for the Tichborne family in the famous trial of 1871–72. He was the first Lord Chief Justice who was granted the office with its present title, instead of the older one of Lord Chief Justice of the Court of Queen's Bench. He was a contributor to the Edinburgh Review and other periodicals.

COLESEED, a name commonly given to a variety of cabbage (*Brassica Napus*) and its seed, the latter often made into oil-cake for feed cattle. See Rape.

COLLATION, in canon law, the act of a bishop in appointing a clergyman to a benefice (whether rectory, vicarage, canonry, or prebend) when the living is in his own gift through lapse or otherwise. In such a case the combination of the act of presentation and admission or institution constitutes collation.

COLLIE, a variety of dog especially common in Scotland, and from its intelligence of much use to shepherds. It is of medium size and varies much in colouring, black and white being common, and black with tan-coloured legs, muzzle, &c., being highly esteemed. The head is somewhat fox-shaped, the ears erect, but with drooping points, the tail rather long, bushy, and with a strong curl. It has an undercoat of short dense hair which enables it to withstand severe weather, and above that a beautiful upper coat of long hair, forming at the neck a prominent ruff.

COLLIER, John Payne, Shaksperean critic, was born in London on Jan. 11, 1789. In early life he reported for the Times and the Morning Chronicle, and until 1847 was a member of the regular staff of the latter in various capacities. In 1811 he entered at the Middle Temple, but destroyed his prospects as a lawyer by the publication of satirical sketches of leading counsel. His real bent was towards literature, to the study of which he was devoted from boyhood. He wrote many critical articles in periodicals, published in 1820 his Poetical Decameron, and thenceforward continued his editions of poems and plays, notably those of the less-known Elizabethan writers. His History of English Dramatic Poetry, published in 1831, secured for him friendship and a pension from the Duke of Devonshire, who made him custodian of his valuable library. He was also allowed free access to the famous library at Bridgewater House, from which he culled the 'Egerton Papers'. He took great interest in and edited many publications for the Camden, Percy, and Shakspere Societies, and completed in 1844 an eight-volume edition of Shakspere. In 1852 he professed to have discovered, on the margins of a copy of the second folio Shakspere, bought from a second-hand bookseller, a number of manuscript notes and emendations written in a seventeenth-century hand. Great interest was excited, and when these notes and emendations were published they became the subject of eager discussion by the critics, the best of whom were not disposed to set a high value on them. Doubts arose as to their authenticity, and in 1859 an examination of the volume convinced the British Museum authorities that the marginal notes were forgeries. Collier published a weak and inconclusive reply, in which he maintained their genuineness, and thenceforward he maintained complete silence on the matter. He continued to produce editions of English writers, among them Spenser, and also critical and autobiographical works, and died at Maidenhead on Sept. 17, 1883. After the sale of his library in the next year, among his papers were found indisputable proofs of a long series of literary forgeries. As a consequence suspicion has rested on all his work, and has obscured the real services he indisputably did to English literature.

COLLIN. See Kollin.

COLLINS, Mortimer, author, was born at Plymouth on June 29, 1827, and educated privately. He was for a time mathematical master in Queen Elizabeth's College, Guernsey, but he resigned in 1856 in order to devote himself wholly to literature. He died on July 28, 1876, at Knowl Hill, Berkshire, where he had resided continuously for eight years. His works include examples of many different styles, ranging from playful verses to political articles. The chief are the books of verse entitled Summer Songs (1860), Idyls and Rhymes (1865), and The Inn of Strange Meetings and other Poems (1871); and the novels, Sweet Anne Page (1868), partly autobiographical; The Vivian Romance (1870); The Marquis and Merchant (1871); Two Plunges for a Pearl (1872); Miranda, a Midsummer Madness (1873); Mr. Carington (1873); Transmigration (1874); Frances (1874); Sweet and Twenty (1875); From Midnight to Midnight (1875); Fight with Fortune (1876); The Village Comedy (1876); and You Play Me False (1878); in some of which his second wife, Frances Cotton, collaborated. His most successful book was the series of essays, The Secret of Long Life (1871), which he published anonymously. He contributed to many newspapers and reviews, and in 1879 Tom Taylor edited a selection of these articles under the title, Pen Sketches by a Vanished Hand. Attic Salt (1880), by Mr. Kerslake, contains a selection of epigrams from his various works. Mr. Collins was a thorough Tory in politics, and a warm supporter of the established religion. He was a fine athlete, and a keen lover of nature.

COLNE, a small river in the West Riding of Yorkshire, flowing N.E. through Huddersfield to join the Calder at Cooper Bridge. It gives name to the Colne Valley parliamentary division.

COLOCASIA, a genus of plants of the natural order Araceæ, the leaves and tubers of which are acrid. The latter contain much starchy matter, and they are used as food in the south of Europe after the acrid matter is separated by washing or boiling. *C. esculenta*, *C. macrorhiza*, and others furnish the *taro* of the Pacific islands. See Cocco Root in Supp.

COLOCZA. See Kalocsa.

COLOGNE EARTH, a kind of ochre, of a deep-brown colour, transparent, and durable in water-colour painting. It is an earthy variety of lignite or partially fossilized wood.

COLOGNE YELLOW, a pigment consisting of 2 parts yellow chromate of lead, 1 of sulphate of lead, and 7 of sulphate of lime or gypsum. It is prepared by precipitating a mixture of nitrate of lead and nitrate of lime with sulphate of soda and chromate of potash. See Chrome Yellow.

COLON (Gr. *kōlon*), the middle portion of the large intestine, or that which lies between the cæcum and the rectum or terminal portion. In man it is about 4½ feet long, and forms a series of pouches in which the digested food is for a time detained. It is itself believed to have some digestive power. See Intestine.

COLON. See Punctuation.